COMPUTERWORLD

Users decry Novell's distance

Enterprise issues force service push

By Elisabeth Horwitt
PROVO, UTAH

■ If Novell, Inc. is going to successfully pitch itself to the Fortune 500 as an enterprise systems vendor, it will have to provide service and support on a par with IBM, according to several major customers of both vendors.

During the past year Novell has introduced support offerings that seek to provide users with the kind of direct, ongoing, comprehensive support they will need as they move from server-centric NetWare to enterprise-oriented NetWare 4.0, Novell spokesmen said.

The vendor's biggest innovation so far is a Master License Agreement, a comprehensive package of direct support offerings for large accounts. For example, Boston Edison Co. got a Novell systems engineer assigned to it, "which is excellent; it gives us direct technical support locally," said John Duhiel, manager of planning and technology at the utility.

Exclusive club

However, Novell users complained that the MLA program is closed to many major Novell customers. Also, it does not address one of their biggest demands: to have more proactive, ongoing communication with Novell about its product directions and how the products can fit together into an enterprise system.

A few large companies such as United Parcel Service, Inc. have a special relationship with Novell, which they have earned by telling major NetWare shops for many years and by providing their ex-

Novell, page 16

AT&T/McCaw ties may boost wireless

Acquisition also seen as ploy by Ma Bell to re-enter local loop; competitors wary

By Joanie M. Wexler
NEW YORK

■ Telecommunications managers agree that the staunch commitment AT&T made to wireless networking last week when it redefined its deal with McCaw Cellular Communications, Inc. will accelerate the deployment of new technologies. It could also ease cross-product connectivity headaches.

However, they also said AT&T's revised $12.6 billion plan to acquire the cellular giant rather than spend $3.8 billion for a 33% stake — the stated intention since last November — is partly an AT&T

ploy to tiptoe back into the local telecommunications market. This could impede progress toward opening up competition in that segment of user networks, the users said.

The acquisition is expected to take a year to complete while the two carriers collect regulatory approvals. The deal could ultimately deliver easier-to-coordinate cellular services in the form of "one-vendor, one-rate, one-service and possibly one point of contact," said Larry Gessini, president of the International Communications Association in Washington, D.C.

For example, users would be able to leverage volume discounts rather than purchase pockets of

cellular service from different carriers at individual rates, he said — a bottom-line plus for large customers.

The McCaw acquisition is yet another component of AT&T's overall strategy to enable users to communicate anywhere, anytime by giving together various wired and wireless networks, primarily through the company's EasyLink messaging network [CW, April 26].

The deal is "good for every firm creating virtual offices and requiring leading-edge technologies," said David Eisenlohr, vice president of systems operations and telecommunications at the Pacific Stock Exchange in San Francisco.

AT&T/McCaw, page 8

In its May 31 issue, Fortune valued McCaw at $7.4 billion. AT&T will pay $12.6 billion for the company. Why the premium? "AT&T is buying access into a whole new market," said Mark Langner at TeleChoice, Inc. in Verona, N.J.

Distributed nets elude IS control

Tech, cost concerns block way

By Johanna Ambrosio

Building client/server applications may be a snap compared with actually managing them once they are up and running. The technology for doing so is immature at best, and most users lack the needed skills and companywide procedures for taming the distributed systems management beast.

Indeed, many customers are just getting started in their search

for the right architecture and associated tasks. At Nike, Inc. in Beaverton, Ore., "We're in the process of maturing our thinking about distributed systems management, and we have a project going," said Don Teel, manager of computing services.

What everyone is looking for, many customers agree, is a sane way of managing geographically dispersed computers and network

Distributed nets, page 14

In Depth
Bye-bye, blue sky

■ Companies cannot afford blue-sky advanced technology groups anymore. For IS chief George Kenney at Swiss Bank Corp. in Chicago, this means choosing technologies that further business strategies. Beginning on page 155, Kenney and five of his peers probe what makes advanced technology groups viable.

Client/server may eclipse Sun

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Sun Microsystems, Inc. is caught in a major client/server squeeze.

Already enmeshed in the desktop, Sun needs to boost the power of its high-end servers if it wants to be a provider in the robust client/server network market, users and observers said.

And that is not all Sun needs to do.

Users at some of its largest sites said the leading Unix workstation vendor must beef up its systems integration and support services to compete with much larger server

Challenges facing Sun:

Strategic. Sun users are demanding improved integration and support services.

Technology. The SPARC architecture has run out of steam.

Financial. Profits are declining as workstations become a commodity.

rivals IBM and Hewlett-Packard Co. for corporate downsizing projects.

Moreover, open systems have turned workstations into a commodity. This means Sun cannot count on repeat workstation business, even from its most loyal customer sites (see story page 12).

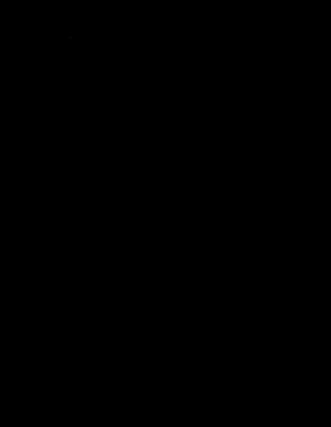At the same time, Sun's share of the workstation market is fastening, as IBM and HP have made inroads in the high end of the general-purpose segment, while Silicon Graphics, Inc. has eaten into Sun's graphics segment, according to analysts.

Sun, page 12

Recent events suggest the administrative burdens of your network could grow substantially.

Are You

Executive Briefing

There's lots of agreement that developing client/server applications is tough, but maintaining them is likely to be tougher (*page 33*), and managing the diversity across geographic stretches could be the hardest part of all. One of the biggest complicating factors for those trying to manage client/server is the diversity of frameworks, products and services now emerging. *Page 1*

Recent additions to the profusion of client/server vendors include Ross Systems, with a new version of its Gembase 4GL that targets both legacy and client/server environments (page 102); and Intersolv, with a new version of its Excelerator analysis and design tool. *Page 39.* Meanwhile, a small vendor, Xtree, jumps into the network and network server management fray, announcing a set of applications that manage a full range of network devices and systems via SNMP. *Page 81*

Novell is trying hard to provide one-stop shopping for corporations seeking an enterprise networked computing strategy. So far, users and analysts like what they see, as the vendor rolls out services. *Page 77.* Customer service and support will weigh heavily in the final decision. Customers who buy from both Novell and IBM say Novell will have to match IBM's standard in these areas if it wants to be their primary enterprise system vendor. *Cover 1*

In his Viewpoint column this week, John Gantz bemoans the lack of CASE tools for client/server. *Page 30.* No sooner said than done: Ernst now offers Enterprise Workbench, which has the ability to integrate upper-level CASE tools from companies such as Bachman, KnowledgeWare and TI. *Page 101*

And just about the time we get all this client/server confusion figured out, pundits are predicting a new challenge called "social computing." What they are talking about is a revolution in how products are marketed and sold, resulting from the emergence of interactive video, wireless communications, groupware and other "democratizing" technologies. *Page 78.* Anticipating this trend, the U.S. government is increasingly doing business and making information available on-line through the Internet. *Page 77.* This week brings conflicting commercial signals about how long it might take to tie everyone into a vast networked computer web. Users anxiously awaiting a developer's kit so they can create applications for Apple's Newton are told they'll have to wait a while longer. *Page 101.* Oracle is hard at work on the massively parallel databases that some say are necessary to make AT&T's manifest wireless ambitions a reality. *Page 8*

Users ho-hum about DOS 6.2

By Michael Fitzgerald

REDMOND, WASH.

A forthcoming update of Microsoft Corp.'s DOS 6.x operating system has raised little excitement among users, many of whom continue to say that the value of utilities in DOS is not enough of a reason to upgrade.

DOS 6.2, which is slated to debut in October, is expected to sport a boosted version of Microsoft's DoubleSpace compression utility and better write-caching [CW, Aug. 16]. Microsoft will also tweak its MEMmaker memory-management utility and fix some segments of its defragment utility, according to sources. Among the things Microsoft is expected to do is add a checksum feature and a diagnostic and repair utility.

Information systems managers at Du Pont Co. said there company never moved to DOS 6.0 because it felt the release was buggy.

Boot so far

Bugs or not, research by WorkGroup Technologies, Inc. shows that DOS 6.x's early acceptance has made it Microsoft's most successful operating system release. "We believe that it has a detoxification rate of about 5% on a base of 5 million installed copies," said John Dunkle, WorkGroup's president. Dunkle said that was better than any previous version of DOS.

"We'll look at it if they fix the bugs," said one manager at Du Pont, who did not want to be named.

Microsoft has steadfastly denied that DOS 6.0 has bugs, though it did post on CompuServe a fix for certain Sharp Corp. notebooks that froze when they tried to run DoubleSpace. Microsoft also posted an update of its SmartDrive disk cache utility.

Other users, such as John Maltby, vice president of technology management at Provident Bank in Baltimore, said a new version of DOS 6.0 mattered little to the bank because it did not see the utilities in DOS 6.0 as enough of a reason to move up from DOS 5.0. However, it is not pulling DOS 6.0 off its new machines.

Not just a bug fix

But while the next revision of DOS looks like a bug fix, Microsoft will not position it as one, sources close to the company indicated. Instead, Microsoft will bill it as an enhancement to the operating system, the sources said.

"Since DOS 6.0 went out, we've talked to customers, and there are some issues. And they have made suggestions as to things that will advance parts of the product, like DoubleSpace," said Tony Audino, director of marketing for the MS-DOS group at Microsoft. "You will not look at it and say 'Oh, they've fixed x and y bugs.'"

Audino declined to comment on specific changes "until our plans are firm," though he did say that one thing customers wanted was the option to debunk DoubleSpace.

Adding to the controversy over the compression utility is the lawsuit against Microsoft from Stac Electronics, Inc., which makes the Stacker compression utility.

Spreadsheet wars

Borland to change Quattro Pro

By Michael Vizard

BOSTON

In a teleconference last Friday, Jack Blount, Borland's newly appointed senior vice president of business development, and users of existing Borland products will encounter no compatibility problems with the changes made in 5.0.

He said the key reader salutation will affect only the small number of Quattro Pro users trying to use 1-2-3 macros, whether written in 1-2-3 or using a 1-2-3 interface. They will have to rekey those features into Quattro Pro 5.0.

Last week, a Lotus spokesman said the company believes Borland can provide macro compatibility with 1-2-3 without violating any of Lotus' copyrights.

While the latest macro ruling is expected to create minor hassles for users, it might have a chilling effect on software development in the long term, said attorneys and users alike.

"The court is sending a message to the software industry that it can't embody any representation of another product without making this kind of ease," said Lee Gesmer, a partner at Lucash, Gesmer and Updegrove, a Boston law firm that publishes the "Technology Law Bulletin."

In the meantime, users said they are more concerned about the long-term implications of the suit than its effect on Borland.

"I hate to sound callous, but to me Borland is irrelevant," said Jerry Schneider, a consultant in Washington, D.C., and a former president of the Capital PC Users Group. "But I still find the ruling to be very frightening. It has the potential to change the way we do business in the software industry."

Echoing Schneider's concerns, the Capital PC User Group, the Long Island PC Users Group, the Sacramento Users Group, the Twin Cities Users Group, the Kentucky-Indiana User Group, the Prairies IBM User Group, the Central Florida Computer Society and the Santa Barbara PC User Group will jointly file a "friend of the court" brief advocating an appeal.

In an industry that requires compatibility across diverse applications to survive, Schneider said, the latest ruling implies that software products may not be so compatible in the future because every application in some way embodies or uses code from another application.

Borland and industry analysts said the court's ruling on this aspect of the case is not consistent with rulings from other court cases. "You have to view this ruling in context. The judge in this case showed his true colors early on," Gesmer said.

International Inc. said it will this week outline changes in the next release of its Quattro Pro for Windows spreadsheet. Version 5.0, that were designed to ensure the application will not violate any of the copyrighted technology in Lotus 1-2-3.

The changes follow a series of rulings against Borland made in a copyright violation suit brought by Lotus Development Corp. The court ruled earlier this month that Borland's use of a key reader feature to make macros compatible across Quattro Pro and 1-2-3 spreadsheets violated Lotus' copyright, and, at Borland's request, issued an injunction against its further use or sale of the infringing technology. The injunction allows Borland to proceed immediately to the Appeals court, and pays off a damage trial until Oct. 3, 1994.

As a result, the next release of Quattro Pro, slated to ship in September, will not make use of the key reader technology. Instead, Borland has devised another method, which it declined to comment on last week, to provide macro compatibility with Lotus spreadsheets, the company said.

Lotus and Borland last week offered conflicting takes on the court's rulings. Borland Vice President Jack Blount said that Jude Keeton's injunction only required that a letter be sent to its partners and resellers, informing them that they can no longer sell applications with the infringing technology. A spokesman at Lotus said Borland is required to terminate any existing licenses, distribute parts or other deals.

Microsoft upgrades Profs link

Michael Vizard

REDMOND, WASH.

Microsoft Corp. last week has released an enhanced version of its PC-to-host mail gateway that, for the first time, includes the ability to share meeting requests between Microsoft's calendaring and scheduling software and IBM's mainframe-based Professional Office System (Profs) and OfficeVision environment.

"In terms of IBM gateways from PC LAN vendors, Microsoft has taken the lead at this point," said David Ferris, president of Ferris Networks, Inc., a consultancy in San Francisco.

At the same time, Microsoft has created a mail driver that, when attached to a Windows client, will allow a single PC to talk to IBM mail environments.

Both offerings were designed to en-

tice IBM mainframe customers considering the move from Profs to OfficeVision to eschew that approach in favor of lower-cost electronic-mail systems running on local-area networks.

"As IBM customers look at the cost of moving from Profs to OfficeVision, they are asking themselves if they should just bite the bullet and go over to PC and it's much cheaper to run E-mail on a PC in terms of cost per seat than on a mainframe," Ferris said.

For example, Southern Company Service, Inc. in Atlanta plans to make a staged migration to Microsoft's Mail from its IBM mainframe. As part of that effort, Southern will initially move from Profs, which IBM no longer supports, to OfficeVision.

"In the long term, we are moving to get rid of the mainframes. But we can't afford to put a PC on everybody's desk, so we're moving to OfficeVision first," said Brian Hays, an E-mail specialist at Southern.

Southern has adopted the Microsoft Mail gateway to Profs and OfficeVision. Microsoft has enhanced its links to these systems by allowing users to share meeting requests between Microsoft's Schedule+ scheduling software for Microsoft Mail and Profs. The

gateway also synchronizes directories, converts Mail into a Profs format and supports the encapsulation of a Mail message across a Profs backbone.

Sacrifice required

But Ferris noted that while the gateways from all the PC E-mail vendors have improved, Profs users will still have to sacrifice some functionality as they move to PC-based systems.

For example, while users can send meeting requests between Schedule+ and Profs, a Profs user can see only that a Microsoft Mail user has a conflict. In contrast, under a Profs-only system, a manager could see what a particular meeting is about and overwrite a subordinate's meeting schedule.

The Microsoft gateway is priced at $1,995. Microsoft Mail Host Access software for an IBM mainframe is priced at $14,995. If users want to connect LANs running the gateway with other LANs, the price of a Gateway Access Component is $695.

The drivers, meanwhile, can be purchased through Microsoft Consulting Services for a $30,000 installation fee on the host, plus $15 per driver, provided there is a commitment to purchase at least 2,000 drivers.

NT readies for prime time

Beta-test users report stability, ramp up for production

By Michael Vizard
REDMOND, WASH.

While Microsoft Corp. has been long-awaited rollout of its Windows NT operating system, the dividends from a protracted beta-test period are beginning to pay nff as early adopters gear up to move NT into production.

Historically, the first release of an operating system is usually accompanied by an extensive pilot project period. But early adopters of NT are reporting that it is now stable enough to begin moving into production.

For example, Nordstrom, Inc. in Seattle has already deployed 15 Windows NT servers in a production environment using beta-test NT code. And the department store plans to deploy as many as 54 Windows NT Advanced Server editions using the general release version of NT by the middle of next month.

"We expect that the general release code has fixed any of the stability problems we have," said Larry Shaw, PC coordinator at Nordstrom.

Meanwhile, Paragon Trade Brands, Inc., a manufacturer of diapers in Federal Way, Wash., is deploying Windows NT as a server in its manufacturing plants. It will then feed data to an IBM Application System/400 system in the company's headquarters.

At the same time, Paragon will deploy some NT workstations, which will be used by managers to compare more than 100 different diaper specifications as part of a drive to improve quality control, said Rich Matthews, Paragon's chief information officer.

"It used to take us five to 10 days to get this kind of information back to the shop floor using a central processor. Now we're trying to get this information back to the shop floor in the same shift," said Matthews, who expects to deploy

the system by the first quarter of next year.

In general, early adopters of NT are satisfied with the performance of Windows NT, whether deployed as an application server or as a file server. In fact, a Microsoft spokesman said the company recommends that customers purchase either Novell, Inc.'s NetWare or Microsoft's LAN Manager if they are looking only for a file server, as these products are faster file servers that are dedicated to this task.

But NT adopters said they are willing to accept this performance trade-off because they do not want to deploy dedicated file servers.

"Our customers don't want dedicated file servers. A server has to be able to do a lot of other things," said Mike Albano, president of PsubInta, Inc., a developer of software systems in Flemington, N.J.

"It was more important to us to have a system that can be easily managed remotely since we're not putting network specialists in at each site. Right now the performance is acceptable, but we made sure NT is scalable in case we have to add more applications later," said Shaw, who in deploying NT as both an application and a file server in a tracking system for Nordstrom buyers.

Missing the point

In fact, some users said people who focus on file-server performance on Intel Corp. systems are missing the point.

"If you're worried about performance on Intel platforms, then you're overlooking one of NT's biggest assets. NT is a scalable operating system, so you can put it up on a R4400 RISC box that is four to eight times faster than an 1486 solution for the same price as a Pentium," said Ted Wayhart, a network design specialist at Bank of America Corp. in Torrance, Calif.

Bank of America, which already has OS/2, NetWare, Banyan Systems, Inc.'s Vines and LAN Server implementations, is currently evaluating Windows NT. "Right now I'm looking at it as a mail server, and some others are evaluating NT as a client/server environment," Vegrating said.

PsubInta is also moving some of its operations from OS/2 to NT. "With OS/2, we always felt we were working with beta software, and we didn't know what IBM was going to do next," PsubInta President Mike Albano said.

PsubInta plans shortly to adopt the Advanced Server edition of Windows NT because that version of NT supports multiple domains. "You need to get operational data out to the business side," Albano said.

Both Paragon Trade Brands and Bank of America intend to deploy the Advanced Server edition for similar reasons, but neither company plans to completely standardize on NT. "We're looking at NT on a per-application basis," Matthews said.

Source: International Data Corp., Framingham, Mass.

Corrections

- In the "Human Resources" portion of the diagram on page 118 this week, both LAN chassis should connect to the bridge/router, not to each other.

- Because of a reporting error, the story "Cisco waves white flag, changes SNA strategy" in the Aug. 16 issue incorrectly stated which product 3Com Corp. will ship by year's end. 3Com will ship APPN Network Node.

- Because of an editing error, a story on Hewlett-Packard Co.'s OmniBook 300 in the Aug. 16 issue incorrectly said the notebook has a 486 processor and a backlit screen. The story should have said it lacks these components.

DEC to push Rdb beyond OpenVMS boundaries

By Craig Stedman
BOSTON

Digital Equipment Corp. plans next month to start moving its Rdb relational database beyond the OpenVMS operating system, but it has stopped short of committing to port Rdb to outside hardware — a step analysts said is needed for DEC to keep up with other database vendors.

At an Rdb conference here last week, DEC said a software developer's kit supporting its DEC OSF/1 operating system will ship next month as a prelude to a full OSF/1 release of the database next June.

Also planned is a Microsoft Corp. Windows NT version, due out in kit form in early 1994 and as a full product at the end of that year, the company said. However, both releases are being promised only for DEC's Alpha AXP hardware at this point.

"We have our plate full now with OSF/1 and NT [for Alpha]," said Rose Ann Giordano, DEC vice president of information systems software. "After we've successfully done all that, I think we can look again at the issue of non-Digital hardware."

Robert Rice, a research specialist at Ohio State University in Columbus, said the OSF/1 and Windows NT versions of Rdb should reduce "complaints that it's a proprietary database running on a single system," even without support of non-DEC platforms.

Analysts, though, said that no Alpha-only Rdb strategy would not provide enough revenue for DEC to match the engineering investments of vendors such as Oracle Corp. and Sybase, Inc. As part of its turnaround attempt, DEC is already cutting back sharply on its overall research and development

budget and is weeding out projects deemed to have uncertain prospects for financial payback.

The company, in fact, planned at one time to move much of its software to other platforms, but that strategy was one of the items placed on the back burner after William Strecker took over as vice president of engineering in late 1992 with the mandate to lower spending by at least 15%

Pricing battle looms

Wes Melling, an analyst at consultancy Gartner Group, Inc. in Stamford, Conn., said an expected database price war will make it even more difficult for DEC to keep pace with other vendors. "In a commodity market, the role is you need volume," he noted. "If you design yourself out of 90% of the market, you've broken the rule."

Rdb is competitive technically now, but it "suffers from a very strong attachment to Digital and its products," added Chris Christiansen, an International Data Corp. analyst. "Users who want hardware independence don't even consider Rdb," he said.

Following a recent reorganization, DEC is now focusing most of its software development on "frameworks" rather than individual applications [CW, Aug. 9]. One such product due out later this year is DB Integrator, which will link different databases into a single logical view.

DEC still views Rdb as its lead database, said Nelson Hsu, client/server and database marketing manager Hsu added, though, that DEC is not looking to displace third-party vendors that support its hardware. "There are some considerations" given to maintaining good relations with those companies, he said.

Multiple version deluge

In addition to the DB Integrator multidatabase manager, DEC has several Rdb-related products due out in the next six months, including two new Rdb releases in its OpenVMS operating system.

Expected early next month, Version 5.1 of Rdb will offer Open Database Connectivity compliance, DEC said. Following in December will be Version 6.0, a major release supporting multistatement procedures, stored procedures and other new functions.

Also on tap is DEC DBA Workcenter, which will group the company's database administration tools into a single product. A release combining existing design, tuning and performance-monitoring packages is due late this year, and DEC said new performance analysis and maintenance tools should follow by mid-1994.

The company also plans to increase the size of databases Rdb can support from 500 to 1000 bytes with Version 6.0, executives said.

SCO licenses Novell technology

The Santa Cruz Operation (SCO) last week said it has licensed client/server software from its biggest competitor in the desktop Unix arena. Novell, Inc.'s NetWare Unix client technology will let SCO workstations act as clients to NetWare servers, SCO said. SCO also revealed a series of alliances with Computer Associates International, Inc., Lotus Development Corp., Wyse Technology, Inc. and Informix Software, Inc.

PC marketing chief resigns from IBM

Sam M. Inman III, president of IBM PC Co. Americas, has resigned to become president of Ingram Micro, Inc. Bruce L. Claflin, former general manager of mobile computing at the PC Co., was promoted to take his place. The PC Co. has not hired a replacement for Claflin. Anthony E. Santelli, who was named president of IBM PC Products, will temporarily take on Claflin's job and continue to run his own division, Consumer Systems, until a replacement is found.

Microsoft server in final test phase

Microsoft Corp. last week announced that Microsoft SNA Server for Windows NT has entered its final beta test phase. The local-area network gateway to IBM hosts has added support for clients using Novell's IPX/SPX protocol, in addition to its existing support for Transmission Control Protocol/Internet Protocol and NetBEUI client access, Microsoft said. The product should be generally available within 90 days, according to the company.

Compaq to release consumer PC line

Compaq Computer Corp. is expected Thursday to announce Presario, a new, consumer-oriented line of desktop computers. Presario will initially come in two configurations, one an integrated 14-in. monitor design with a 25-MHz I486SX CPU, the other a 33-MHz 486SX with three slots and three bays and an unattached monitor, according to sources. The integrated, plug-and-play version of Presario will fetch a street price of $1,400, while the faster but unintegrated model will be priced at $1,300. There will be some overlap with ProLinea for a while in consumer electronics stores and other outlets. A Compaq spokesman refused to comment.

SHORT TAKES James Champy, president of CSC Consulting and co-author of the best-selling book *Reengineering the Corporation*, has been promoted to corporate vice president of Computer Sciences Corp., the consulting firm's El Segundo, Calif., parent. Champy remains chairman of its CSC Index, Inc. unit but will be replaced as chief executive officer by David Robinson, who now serves as president of the Cambridge, Mass., consultancy . . . Apple Computer, Inc. equipment is five times more likely to be stolen than IBM PCs and their clones, according to an upcoming report by the Stolen Computer Registry . . . Eicon Technology Corp. in Montreal is expected last week to announce wide-area network services for NetWare, which is said to be the first product to provide wide-area connections for both Novell's Multi Protocol Router and NetWare for SAA gateway to IBM hosts . . . Wang Laboratories, Inc. said it passed another milestone in its Chapter 11 bankruptcy restructuring process, signing an agreement in principle for a new credit line with Congress Financial Corp. The deal provides for Wang to get an interim credit line of up to $40 million that would be replaced by a $30 million lending facility after the company emerges from Chapter 11.

Wellfleet enters WAN world

First LAN vendor into telecom arena hopes to beef up public services

By Joanie M. Wexler
BILLERICA, MASS.

Taking a key step toward providing users with wide-area data services on a par with those found on local-area networks, Wellfleet Communications, Inc. last week became the first LAN vendor to cross over into the telecommunications market.

The router company made greatly available its Backbone Node Switch (BNX), a modified version of its Backbone Node LAN internetwork router. The BNX is already serving as an access point on the fringe of MCI Communications Corp.'s and Canadian carrier Stentor Resources, Inc.'s networks.

The goal with the BNX is to stretch Wellfleet's expertise with multiple data protocols into the wide-area network so the services users have on their premises match those inside the carrier network, explained David Yates, Wellfleet's BNX product marketing director.

Serving as a long-term objective with Asynchronous Transfer Mode networks, which will eventually run both as a LAN and as a WAN.

Some of the potential services carriers could deliver through the switch, according to Yates, are packet billing options for frame-relay services, which today are usually billed on a flat-rate basis; T3 (45M bit/sec.) access into carrier backbones; native LAN-speed services across the WAN; and the ability to open a management window into the public network to users.

MCI spokeswoman Pam Small said MCI is already implementing the frame-relay, usage-sensitive pricing in its Hyper-Stream service and Simple Network Management Protocol management capabilities via the BNX.

According to one analyst, "there's most on them boxes" with the Wellfleet strategy.

Private LAN internetworks exist because "the carriers did a bad job of knowing how data services were going to evolve," said Jay Batson, an analyst at Forrester Research, Inc. in Cambridge, Mass.

For example, "if AT&T could provide you with a private IP network that you could buy and plug into, you'd be happy," he said.

The BNX provides a steppingstone for carriers heading in that direction, Batson said.

What remains to be seen, however, is whether the LAN vendors can rival traditional telecommunications equipment providers in building extremely scalable equipment to serve thousands of lines.

"Wellfleet's architecture is best-positioned to do that," Batson said. He was referring to the distributed nature of the Backbone Node, which allows network modules and corresponding processing power to be added incrementally with no drain on any centralized components.

"The question is whether the carriers want to provide LAN-like services," Batson said. "If they do, they need extra software, and the router vendors have it."

A step further
Wellfleet's BNX occupies a position in a carrier's network similar to that of Cascade Communications, Inc.'s and Stratacom, Inc.'s frame-relay access switches. Observers pointed out that these vendors' switches merely provide a way to transport electrical signals from one point to another, not the software needed to deliver LAN-like services.

IBM plugs blueprint gaps, lets users mix and match

By Joanie M. Wexler
WHITE PLAINS, N.Y.

IBM kept its nose to the grindstone last week in its endeavors to ease users' interoperability and management frustrations with multiprotocol networking.

The vendor filled in several areas of its Networking Blueprint, the official IBM strategy to help companies bring harmony to a mix of networks, systems and protocols. The company's product announcements focused largely on broadening the role of IBM's in the enterprise, blending IBM and other protocols into a single wide-area backbone and stretching the scope of IBM's Unix-based distributed management system.

Such moves "help users begin to get their hands around the many combinations of protocols that are in their enterprises today," said Mark Pozelsky, Multi-Protocol Transport Networking (MPTN)

product and systems manager at IBM.

In the area of mixing and matching existing applications with nonnative transport networks, IBM enhanced its AnyNet product line. AnyNet software represents the product implementations of IBM's MPTN strategy, which is to build software that allows applications written for a specific transport network, such as Systems Network Architecture (SNA), to run across other networks, such as Transmission Control Protocol/Internet Protocol (TCP/IP).

Plans and products

Among IBM products and statements of direction announced last week were the following:

- AnyNet/2 for OS/2 on disk. This allows IBM Advanced Program-to-Program Communications applications to run over TCP/IP and OS/2-based TCP/IP applications to run over SNA. Previously, users

could get the capability to downloading it from an MVS host. Available Sept. 3 for $150.

- A statement of direction to run NetBIOS-based applications such as Notes over SNA networks, eliminating today's necessary gateway function.

- X Window System client software for OS/2 for delivering OS/2 host applications to windows on user desktops.

- A frame-relay link for the 3172 cluster controller for combining multiple protocols onto one wide-area network link.

- Availability of IBM's System Monitor on Hewlett-Packard Co. workstations and the ability to manage Unix networks connected to SystemNet mainframes using NetView.

Also, IBM said it will begin broadening next month to allow NetView/6000 to capture IP topology data and pull it into Sybase, Inc. and Informix Corp. databases. It will begin storing Oracle Corp. database support by the end of the year. This capability is already available with The ASK Group, Inc.'s Ingres Products Division databases.

Oracle solving wireless puzzle

By Kim S. Nash

REDWOOD SHORES, CALIF.

Oracle Corp. has done much of the groundwork necessary for building viable massively parallel databases, which are required to make wireless dreams such as those of AT&T and McCaw Cellular Communications, Inc. come true, analysts said last week.

Several last sides are running massively parallel Oracle 7 on a variety of machines, including those from Thinking Machines Corp., NCR Corp., NCube and Encore Computer Corp.

Furthermore, Oracle is providing the database and development tools necessary for US West, Inc. to deliver interactive wireless and cable services. Oracle said it hopes its US West experience will lead to a partnership with US West, dubbed Oracle Data Publishing, was an attempt to deliver libraries of published information to PC users over cellular networks. However, no commercial products emerged from the pact. "The fact that the project is over doesn't preclude us from working with AT&T or other communications companies," Negris said.

Administering service and billing of the combined AT&T and McCaw will require large-scale multiprocessing software to manage terabytes of data and thousands upon thousands of queries.

Massively parallel databases are "key to getting these grand schemes off the ground," said Ira Brodsky, president of Datacomm Research Co. in Wilmett, Ill. "But I don't see AT&T going after that kind of complex application right away."

The waiting game

More likely, the company will put off developing new kinds of data and video services that would require immediate substantial software investment, Brodsky said. Instead, AT&T will repackage existing services, such as New Jones Newswire, with a customized AT&T interface.

Meanwhile, Oracle and US West are working to build a worldwide digital network — prototypes are promised by the end of the year — to be managed by massively parallel versions of the Oracle 7 database [CW, May 17]. That deal calls for the firms to build a network of massively parallel computers and software to manage the terabytes of data expected to be generated by blue-sky concepts such as video-on-demand and home multimedia services.

AT&T/McCaw ties may boost wireless

cisco. While the exchange is itself embarking on virtual office plans, it has made no wireless decisions yet because of perceived security problems with the technology.

Large companies "will see more and more nifty services" because AT&T will likely able its financial and development resources higher on the table with its larger-than-planned — and biggest-in-history — acquisition, Eisenlohr predicted. AT&T's 1991 purchase of NCR Corp. cost a paltry $7.4 billion in comparison.

"Wireless will get more play with AT&T now than if the company just owned a third [of McCaw]," agreed Bob Rich, an analyst at research firm Dataquest, Inc. in Framingham, Mass.

Problem-solver

Meanwhile, some predicted that AT&T's end-to-end wireless suite, which has now added wireless network service to its repertoire of chips, modems and wireless-equipped notebooks [see time line], will "ease the connectivity problem of building the network and getting the various components to talk to each other," said Peter Caserta, chairman of Information Technology, Inc. in Manhasset, N.Y., a wireless technology company with a systems integration subsidiary.

On the other hand, the McCaw deal could also allow AT&T to put smaller cellular-operating companies out of business, Eisenlohr said. He predicted most of those carriers "will not survive" when pitted against AT&T's financial muscle.

Phil Evans, director of telecommunications at Peter Systems Corp. in Dallas, agreed that AT&T is probably looking "to save lots of

AT&T's wireless milestones

March 1993
AT&T Mail is delivered to pagers on SkyTel one-way satellite messaging network.

November 1991
AT&T obtains FCC license for spectrum in the 6-GHz range for personal communications system trials begun testing in Atlanta, Boston and Los Angeles. These trial will fit with McCaw cellular network is still undecided.

November 1992
AT&T buys a separate 33% equity in McCaw. AT&T/Mail is integrated into the EO, Inc. two-way, cellular-capable personal communicator.

February 1993
AT&T/Mail is delivered to pagers on Embarc one-way satellite messaging network.

1993
Intel Corp. bundles AT&T/Mail software into its modem for wireless transmission.

August 1993
AT&T signs $13.6 billion acquisition agreement with McCaw.

September 1993*
Users of AT&T/Mail on AT&T EasyLink wired network and RAM Mobile Data's packet radio network can exchange messages.

*Planned

Source: AT&T   CW Chart: Dave Marshall

money bypassing the local-exchange carriers and providing direct access "into their network.

However, AT&T Chairman Robert Allen assured the industry in a prepared statement that "AT&T is not interested in re-entering the local telephone business" and stressed that cellular services enhance, rather than replace, local telephone service.

Competition is fierce

McCaw, said to have garnered about 25% of the cellular market, faces prime competition from MobiLink, a consortium of local carriers that last month collectively launched a cellular voice network spanning 90% of the U.S. and Canada. MobiLink members include the regional Bell telephone companies, which still fall under the AT&T divestiture's regulatory restrictions, and GTE Corp.

MobiLink President Andrew Burroughs said the AT&T/McCaw turn of events "validates our strategy plan to combine our resources and launch [our network] in July." However, the playing field is not level, he said, in that AT&T "has all the advantages of packaging goods and services internationally, while our members can't do that."

But he said he would rather see the Bells opened up than AT&T restricted. "We'll stand our own ground," he said, "but the regulators must look at this closely."

AT&T said the merger will result in no job losses at either company and that it intends to fuel its innovative, entrepreneurial McCaw spirit.

"There will be a similarity to how we approached the NCR deal," said Jim Cosgrove, AT&T's vice president of data communication services. "You don't spend that much money to buy a company, then tear the organization apart."

Data over cellular

Cellular networks have to date primarily handled voice communications. Last April, however, McCaw spun off a Wireless Data Division focused on hosting the Cellular Digital Packet Data (CDPD) protocol that allows data to run over cellular networks in the "empty" bandwidth created by voice pauses.

CDPD technology competes with packet radio networks for transporting data. McCaw's stated goals have been to bring data services to 50% of its network this year via CDPD and to the other half in the second quarter of 1994. But McCaw will not implement data service on all channels or all cells in these initial phases, so coverage will not be as pervasive as now for some time. —Joanie M. Wexler

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EO on the Go

AT&T's positioning of its mobile troops does not leave off with the sweeping McCaw acquisition.

As a participant in the gamut of wireless-oriented markets, from equipment to network services, AT&T quietly merged its EO, Inc. personal communicator organization on Aug. 18 with Go Corp., a Foster City, Calif., pen-based operating system developer in which it held an equity stake.

AT&T had become a majority owner of EO in an agreement consummated last month. The goal of the Go merger is to more tightly integrate

the communications functions being developed by EO and AT&T Bell Laboratories for the personal communications system with those created by Go for its mobile PenPoint operating system, AT&T said.

However, in the meantime, AT&T has cut half of Go's staff, and some of the company's visionaries have left in the wake of the deal. Founder Jerrold Kaplan resigned, as did development guru Robert Carr; Bill Campbell, Go's former president, also left but will remain on the board of the new entity.

The EO is AT&T's chosen platform for its personal communications system, an emerging product category that combines pen technology, computing, voice and data communications and personal productivity functions in a portable, tablet-size device.

AT&T's EO, with a cellular telephone and cellular data link, costs up to $4,300, according to AT&T spokesman Steve O'Donnell. The device comes with nine standard personal productivity applications.

Users can purchase the EO without communications capabilities for $1,899, he said.

—Joanie M. Wexler
and Michael Fitzgerald

IBM throws lot in with OSF's standard

Novell, Banyan also choose DCE, but only for linking networks to Unix hosts

By Elisabeth Horwitt
ARMONK, N.Y.

IBM is betting its client/server strategy on the Open Software Foundation's (OSF) Distributed Computing Environ- ment (DCE) as a network operating sys- tem standard, company spokesmen said at a teleconference last week.

Toward that end, IBM will next week disclose DCE client support for OS/2, along with plans to roll the middleware standard across all IBM systems by the end of 1994, said Art Olbert, IBM Personal Systems director.

Currently centered in the Unix world, DCE defines how distributed, peer-to- peer multivendor systems can share re- sources and applications. IBM sees DCE as a way of providing "industrial- strength" local-area network platforms on which users can safely and confident- ly rightsize applications, Olbert said.

While IBM may have turned to DCE support to differentiate its own cli- ent/server system, LAN Server, from competing products, it may be more dif- ficult to persuade rival network operat- ing system companies to adopt the OSF standard, said David Strom, president of David Strom, Inc., a consultancy in Port Washington, N.Y.

Taking sides

So far, Microsoft Corp. has studiously ig- nored DCE, while Novell, Inc. and Banyan Systems, Inc. have said they will support the OSF standard primarily as a way of linking to Unix hosts but not necessarily as a way for clients to link up to their own servers. The primary rea- son, analysts said, is that DCE's underly- ing peer-to- peer services compete direct-

> So far, Microsoft has studiously ignored DCE while Novell and Banyan have said they will support the OSF standard.

ly with the services that network operat- ing system vendors provide on cli- ent/server platforms.

This leaves IBM a clear field in the DCE-based client/server market, where it plans the following announcements and demonstrations, spokesmen said:

• A DCE client for OS/2, at the Interop '93 August show this week in San Francisco, which would provide the first Intel Corp.- based DCE platform.

• A demonstration, also at Interop, of LAN NetView, an OS/2-based platform for managing DOS, Windows, NetWare and OS/2 systems. A shipment date will be an- nounced by early fall.

• Another Interop demonstration, this one of a prototype of LAN Distance, soft- ware said to enable remote Windows, DOS and OS/2 clients to access a NetWare or LAN Server system over a dial-up tele- communications link — and get the same level of performance as they would if they resided on the LAN.

• An announcement by year's end of a shipment date for a Windows DCE client and DCE support for LAN Server. IBM plans to have DCE support on all its ma- jor computing platforms by the end of 1994; it already supports DCE on AIX.

In best of all open worlds, users want even more options

In an open systems world, users can opt to replace aging Unix equipment with products from a variety of competitors, especially when pricing from all the major vendors is extremely competitive. This environment could prove particularly dangerous to Sun, which may be losing its hold on key accounts for other reasons.

Earlier this month, Sun's $75 million bid to outfit the National Security Agency (NSA) with a secure Unix workstation system was suspended after several other workstation vendors questioned Sun's benchmarks [CW, Aug. 9]. The contract for the super-secretive NSA, for which Sun is reportedly the dominant workstation supplier, could be worth $200 million over a five-year period.

Early users of Sun workstations for scientific and technical applications are among those likely to consider other platforms. One of the largest Sun sites, the Jet Propulsion Laboratories in Pasadena, Calif., has an open bid on a contract for systems compliant with Unix System V Release 4.

Others, such as the Woods Hole Oceanographic Institute in Woods Hole, Mass., are mixing Sun machines with Silicon Graphics workstations for some imaging applications. "I don't see an exodus from Sun to SGI," said Robert C. Groman, director at the Institute's Information Systems Center. "But people want to keep their options open."

To keep users happy, Sun is playing to its strengths, such as financial analysis and networking, in its systems integration and consulting business. On Wall Street, Sun is paying attention to loyal users of the "trader" workstations with the SMCC Professional Services Group, said Tony Iams, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y.

The plan appears to be paying off: "It's probably not on the level of its competitors," Iams said, "but it's making inroads." *— Jean S. Bowman*

Sun eclipse

These glaring weaknesses are coming into focus as the highflier of the 1990s comes down to earth. Sun's revenue grew 20% for the year ended June 30, reaching a record $4.3 billion. Profits, however, fell almost 10% to $164.7 million for the year (see chart).

Sun controller Mike Lehman attributed the profit sag to delayed delivery of products based on high-end SuperSPARC chips.

Seeking to block any further signs of a slide, the company is busy attacking key problem areas, starting with servers.

Sun will make its high-end servers more attractive by year's end by letting users take full advantage of the 20 processors on board the SPARCcenter 2000 and by adding power to the eight-CPU symmetrical multiprocessor SPARCserver 1000. But the addition of more horsepower requires a new release of the Solaris 2.X operating system — Solaris 2.3 — which is set for this fall, Sun said.

Some industry analysts said they also expect Sun to power up its servers by "teaming" Scalable Processor Architecture (SPARC) CPUs with new architectures such as clustered systems. This may be the only way Sun can boost systems power short of adding chips even faster than SuperSPARC. The company is also developing a 64-bit SPARC implementation with Intergraph Corp.

In battles where performance requirements exceed its high-end offerings, Sun often recommends SPARC-compatible systems from other vendors. Sun Chief Executive Officer Scott McNealy said, "If you need something bigger, with more floating points or more vectorization, it's all the same operating system and the same chip."

Cray Research, Inc. will begin marketing a Unix superserver based on SPARC chip technology and the Solaris 2.X operating system, financial analysts said.

But as Sun pushes high-end servers, the company is bumping up against IBM and HP again, both of which are much more experienced at managing projects involving complex commercial applications and legacy systems. "Sun is able to respond to competitors, but when you have assaults from multiple directions Sun well-heeled competitors, there's only so much turf you can expect to hold," said Gary Smaby, president of Smaby Group, Inc. in Minneapolis.

Wearing a new hat

Sun's recent foray into systems integration services with its Sun Networks consultancy [CW, June 28] is aimed at leveling the playing field. Shooting to keep overhead as low as possible, Sun Networks will work with outside vendors such as Electronic Data Systems Corp., Andersen Consulting and value-added resellers to meet information systems' integration needs.

"We don't want to go in and implement; we only want to go in and architect," McNealy said. "You need one architect to build a house, and you need 100 people pounding nails."

Getting users to adopt Transmission Control Protocol/Internet Protocol networks is Sun Networks' goal, McNealy said. "Then we can start hanging nodes off it left and right: SPARCcenter 2000s, SPARCserver 1000s or departmental network servers," he added.

Even so, the promised land of high-end servers will not be reached without accommodating user preferences for other vendors' standards, as Sun did by supporting the Open Software Foundation's Motif user interface, users said.

And some said Sun still has a lot to learn about systems integration, support and the scalability of back-end production systems.

"The truth of the matter is, they need to get a little more customer-driven," said Michael Prince, director of IS at Burlington Coat Factory, Inc.'s data center in Aetna, N.H., which has 300 Sun workstations. "If you're going to be in the data center doing MIS-kinds-of-applications for your customers, then you've got to be a different guy than when you were selling workstations to engineers."

Prince, who uses six Sequent Computer Systems, Inc. machines for back-end processing of Oracle Corp. database applications, said he worries about round-the-clock performance and support no matter who sells the system. "There really is a level of commitment one gives to the strategic, mission-critical data of a corporation that just isn't there with the applications that [manipulate] that data," he said. "When that server goes down, the whole company's paralyzed."

This winter, Burlington Coat Factory will put Oracle 7 Parallel Server on its Sequent clustered system, one application that runs as its primary production database system. Sun does not sell a similarly configured system, though Sun systems do run Oracle.

Some improvements

Users acknowledged progress in Sun's service offerings, which need to be the firm's Achilles' heel with commercial IS sites. Last month, Sun spun off a SunService global service division to handle multivendor computing sites.

Sun has also simplified its software maintenance contracts, noted James Stikeleather, director of systems development at Kash n' Karry Food Stores, Inc., a $1.2 billion Tampa, Fla., grocery chain. "It's recognition that, in the commercial environment, things are more centralized," Stikeleather said. "When I've got 300 machines sitting out there, I don't want to have 300 different maintenance contracts."

But users and industry analysts said they are convinced that Sun will have to make a much bigger effort as a systems integrator and service provider at large corporate sites if the high-end servers are to succeed with IS managers from mainframe shops.

"They're starting to broaden their scope and to try to solve broad business problems beyond their own product set," said Bruce Merkin, director of workgroup computing at Nynex Science & Technology, Inc., a Nynex Corp. research subsidiary in White Plains, N.Y. "But when you talk to other consultancies, such as those in IBM, you see they're way ahead in having the skills and knowledge to provide those services."

Distributed nets

CONTINUED FROM COVER 1

gear from multiple vendors. Most of the functions needed for this world boil down to new twists on old ideas used in the mainframe and minicomputer environs; concepts such as capacity planning and electronic software distribution are relatively new.

Not helping matters is the confusion engendered by the diversity of products, frameworks and services now emerging from a raft of vendors that are approaching the problem from different perspectives (see story below). "Vendors all use different terms," said Mitchell Kramer, an analyst at the Patricia Seybold Office Computing Group in Boston. "That makes it hard to compare and contrast products."

This situation will likely take at least three years to fully shake out, industry watchers said. In the meantime, customers are advised to start choosing products and platforms that are available, that can work with whatever they already have in-house and that are at least promised to work within proposed industry standards such as the Open Software Foundation's Distributed Management Environment. Some larger information systems shops, particularly Wall Street brokerages, have started writing their own tools.

Management needed

It would be suicidal to wait for the market to settle down completely before doing something, observers cautioned. "Over half of all client/server projects fail, and 90% of them because the right systems management structure was not put in place," said Jeremy Frank, an analyst at Gartner Group, Inc. in Stamford, Conn. "The ability to deploy client/server is way ahead of the ability to manage it."

Nike started with the basics: polling its end users to figure out the gaps in its service coverage, Croft said. It came up with a list of 10 hot buttons that would be applicable to any Fortune 1,000 company and is working to identify tools to address them. Among them were the following:

- Electronic software distribution: sending new releases of PC software to hundreds or thousands of workstations.
- Backup and recovery of local-area networks.
- Critical resource management: looking at what computers and networking resources are needed for a particular application.

Another key component in distributed systems management is configuration management or knowing exactly what every end user has in his computer and being able to change that configuration from a central spot, adding user identifications, for example.

"Some of the functions mirror what you do with a host, but the process is very different,"

said Mark Armentrout, manager of network services at Atlantic Richfield Co. in Plano, Texas. In the host environment, for example, there may be thousands of users sharing one resource. In distributed systems, the issues are, for example, should servers doing essentially the same thing — all the electronic-mail servers, say — be grouped together on one network, or should they be put on separate LANs because of bandwidth problems? Organizational issues come up as well. For example, the vast majority of IS shops are still segmented along technology lines — with experts in PC hardware, mainframe systems software and networking — when what is needed is a more team-oriented approach where all the gurus work together to solve the problem. (Computerworld will address organizational issues related to managing distributed systems in a Management article in the Sept. 6 issue.)

But that is often difficult to put into practice. "Members from each organization often wind up pointing fingers at each other," said Russ Prins, director of computer operations at US West in Albuquerque, N.M.

"A lot of little fiefdoms have grown up, people protecting their jobs around the technologies," said Bjorn Larseo, president of Votek Systems Ltd., a software vendor in Richmond Hill, Ontario. Often, he said, the IS organizations cannot agree on even the definition of a problem, much less how to report it and resolve it. "All the barriers have to come down," he said.

And even when there is agreement, there must be vigilance. "Sometimes you find out what you thought was taken care of was not," even for things as seemingly straightforward as how to handle user log-ins, said Andre Price, a staff member at a defense contractor that cannot be identified.

Prod001twise, "things are a lot better than they were a year ago," Croft said. "But in the good old Nike spirit of just doing it, we will have to be our own systems integrator initially."

Show becomes interoperability guide

By Joanie M. Wexler
SAN FRANCISCO

As organizations plunge ahead in their frenzy to glue heterogeneous network islands into cohesive distributed computing environments, technology managers are searching for proof of product interoperability and multiprotocol education anywhere they can find it.

Enter this week's Interop '93 trade show, a changed beast from the onetime haunt of technowizards who rolled up their sleeves, shook hands and just made things work.

Now, according to several campuslike organizations, Interop has also become an invaluable resource in an industry where education and large-network prototypes are hard to come by.

For example, Marian Dowling, the Internet manager at the Naval Research Laboratory in Washington, D.C., said she leveraged some router performance benchmark results distributed at a recent Interop show to confirm that the agency was likely to take a performance hit if it hooked up its Proteon, Inc. router to a T1 (1.5M bit/sec.) circuit.

The results came from Harvard University consultant and tutorial instructor Scott Bradner, who performs vendor-independent performance benchmarks on router products running various protocols over different network types.

His results, distributed as part of his tutorial session, indicated the Proteon router "had a problem with small packet back to back" over T1s, Dowling said. The laboratory has since swapped out its external router to a Cisco Systems, Inc. AGS+, she said.

Haunted by the past

Organizations such as Dowling's are at the mercy of the multiprotocol whims of various departments or business units, which have traditionally made their own networking choices and are now looking to central information systems departments for internetwork connectivity and management.

At the University of Maryland/Baltimore County, for example, "one of our biggest questions is how to manage the mishmash of networking," said Daniel A. Dinkin, network manager.

At Interop '93 Spring in Washington, D.C., Dinkin attended an introductory course on the Simple Network Management Protocol (SNMP), "which gave me a basic understanding of how it works and relates to everything in my network," he said.

He said he learned that SNMP is being extended beyond Transmission Control Protocol/Internet Protocol networks, "which is important to us because our protocols are always changing, and we always have many."

Dinkin and others said they are largely convinced of the product interoperability demonstrated by Interop's various showcase networks running different vendors' products.

"The show has proven to me that you don't have to make everything fit by having all your equipment come from one vendor," Dinkin said.

"The proof is in the pudding," added Barbara Jennings, project leader for mail connectivity at Sandia National Laboratory in Albuquerque, N.M. As a contractor to the U.S. Department of Energy, Jennings explained, Sandia falls under the federal mandate that all now procurements comply with Government Open Systems Interconnect (OSI) Profile standards.

"We're all new to OSI," she said. "To address the government mandate, we're having to test a variety of products that are not yet proven. This would take us a lot of time and money to do on our own."

Jennings, who describes herself as a "networking neophyte," said Interop is the only networking show she attends.

"My focus is to get interoperability established between heterogeneous mail applications and hardware platforms" and to make sure they are X.400- and X.500-compliant, she explained.

"When something is new, it's important to have a huge network like that — a working model of what works," Dowling said.

News Shorts

Wang beats Microsoft

After successfully forcing numerous makers of single in-line memory modules to license its patented technology, Wang Laboratories, Inc. has filed a new lawsuit charging Microsoft Corp. and a smaller software company with infringing on two patents awarded during the past year. The suit, filed in U.S. District Court in Boston, alleges infringement on patents covering object managers and a composite PC-based document scanner and processor. Wang would not identify the Microsoft products at issue or say whether it plans to try to invoke the patents on a wider basis, as it did with the memory module technology.

Routers on speaking terms

Networking bigwigs Cisco Systems, Inc. and Novell, Inc. last week said they have teamed to assure interoperability among their router products. The efforts include Cisco support of Novell's NetWare Link Services Protocol, an algorithm that enables routers to exchange network information. The two companies said they will demonstrate their products working in harmony at this week's Interop '93 August show.

McAfee reorganizes execs

Only 16 months after going public, the board of security vendor McAfee Associates has repositioned the role of co-founder John McAfee and brought in a new chief executive officer to head up the antivirus software maker. Bill Larson, a former SunSoft, Inc. vice president, was last week named CEO of the firm. McAfee will assume the position of chief technical officer and remain chairman of the board. The Santa Clara, Calif.-based company recently signed a letter of intent to acquire database developer Buttonware.

Hold on to your PC software in L.A.

More software gets pirated in Los Angeles than in any other U.S. city, the Software Publishers Association said last week. The group counted the number of legal actions taken this year, and Los Angeles came in first, followed by New York, San Francisco and Houston.

Industry teams on infrared link

A nonprofit organization has formed to standardize wireless connectivity between mobile and desktop PCs and peripherals using an infrared link. Among the 75 initial IndRed Data Association members are AT&T, Apple Computer, Inc., Hewlett-Packard Co., Microsoft Corp. and Novell.

Bachman posts Q4, year-end loss

Bachman Information Systems, Inc. announced a fiscal fourth-quarter loss of $4.7 million, widening its 1993 deficit to $14.7 million. Included in the loss was a $4.6 million restructuring charge, the Burlington, Mass., tools vendor said. Bachman earned $2.5 million last year. Fourth-quarter and year-end revenue nose-dived 25% and 23% to $9.3 million and $36 million, respectively.

SHORT TAKES Several consulting organizations have banded to form the RightSource Group, whose aim is to provide client/server services nationwide . . . Hewlett-Packard last week announced the availability of LAN Manager for Unix for the HP 9000 Version 2.2, an enhanced version of networking software that lets PC users share applications and resources on HP 9000 Series 800 business servers and HP Apollo 9000 Series 700 workstations . . . Apple has announced the Macintosh Hardware System Update Version 2.0, a troubleshooting update that, among other things, manages I/O more effectively and addresses possible floppy and hard disk problems.

Novell preps support for TCP/IP

Users will be able to access protocol over LANs or WANs

By Elisabeth Horwitt
PROVO, UTAH

Novell, Inc. is preparing to announce its first full native support of Transmission Control Protocol/Internet Protocol (TCP/IP) on its upcoming release of NetWare 5.12, according to a user who is scheduled to shortly receive a beta-test version of the package.

Novell has long had an authenticated relationship with TCP/IP. Novell Chief Financial Officer Jim Tolonen recently claimed that Novell is the No. 1 shipper of TCP/IP products worldwide, excluding its Unix Systems Group division.

Yet Novell's support of TCP/IP on NetWare is currently limited to encapsulating IPX commands inside TCP/IP packets, said George Powers, Novell's director of internetworking product development. Encapsulation enables clients to access a NetWare server via TCP/IP but can hurt response time.

TCP/IP instead of IPX

NetWare over IP, now in beta testing, will enable clients to access NetWare servers using TCP/IP instead of IPX over a local- or wide-area network, Powers said.

Novell will provide the above capability to NetWare 5.11 users in the next 3.x release, according to Charles Tibury, a network analyst at the University of Texas M.D. Anderson Cancer Center.

Tibury said he expects to receive his beta-test copy shortly. Novell would not comment on the unannounced NetWare 5.12.

M.D. Anderson hopes to use the product to replace IPX with TCP/IP as a way of linking more than 100 NetWare servers. Tibury said. This would enable the center to link its Novell servers to higher-end systems that support TCP/IP but not IPX. In addition, TCP/IP generates less traffic than IPX because the former is a "connectionless protocol" that goes ahead and sends without first checking to see whether the recipient is there, Tibury said.

Novell has been addressing the problem of overhead in NetWare communications through its NetWare Link Service Protocol (NLSP), which reduces NetWare traffic overhead by an order of magnitude, Powers said. NLSP is slated to ship in first-quarter 1994.

Users decry Novell's distance

pertise as beta-test sites, according to Marv Dodge, the package handler's telecommunications manager. Such companies learn early about upcoming strategic announcements and can call high-level Novell technicians for help in pinpointing the source of multivendor network problems, Dodge said.

However, most other companies do not get this kind of treatment, Dodge said. "I've heard other companies complain about how difficult it is to get questions answered about networking problems and on how to use NetWare to support their applications."

No guarantees

Being a large Novell shop does not guarantee satisfactory support, users said. "Our IBM rep is on site once a week; everyone knows him. Novell reps show up on the rare occasions when I ask about a new product," said Glenn Fund, president of the Boston Area Novell Users Group and head of networking at a New England-based defense contractor. "Last time we talked with Novell, they wanted guarantees of $250,000 [in Novell purchases per year], then you get special discounts and briefings."

"I want the latest patches and updates [to existing NetWare products] coming into my desk automatically, and I'd like to learn what they do without having to go chasing through NetWire," Novell's on-line CompuServe bulletin board, said Robin McCubbin, a network planning analyst at National Grocers, Inc.

The Ontario grocery chain's total Novell installed base is valued somewhere between the $150,000 minimum Novell originally required for its MLA program and the $250,000 the vendor is now asking, McCubbin said.

This is frustrating because the figure changed while National Grocers was considering the program, he added. "We'd prefer that they say, 'Pay this, and you get these services.'"

"I feel like I should become a Platinum reseller" to get Novell's full attention, McCubbin said.

Customers that do not make Master License status can purchase several of the program's services for a fee, a Novell spokeswoman said. For example, non-MLA members can purchase from Novell the services of an assigned account technician to provide "personalized support" for $15,000 per year, plus an additional $15,000 for an unlimited support contract with the vendor.

A lack of directional information from Novell also puzzles information systems managers. In particular, several corporate users said they are peeved that the only way to get advance information on fast, upcoming announcements from Novell is to become a beta-test site for such products.

"We read about announcements in the press," Dubiel said. "This makes it difficult to plan the direction of our networks and corporate computing infrastructure."

A Novell spokeswoman said the vendor does not plan to change its briefing strategy. However, it may disclose information more informally during "dialogue with national accounts," she added.

Users in the dark

Boston Edison's John Dubiel wants better information faster

Novell may be losing potential converts to its enterprise strategy through its failure to provide regular briefings that help users understand its strategy as it unfolds. "Give us your vision and tell us how the pieces fit together, [Novell]," Dubiel said. "AppWare was a huge announcement and will become available next May, which is pretty quick. But right now I don't understand the significance or how we take advantage of it."

As a result, some corporate users said they are willing to pay Novell, as they increasingly pay IBM, for high-level, on-site support from systems engineers.

That is the direction in which Novell is heading with the MLA umbrella of services. The program provides options such as an assigned or dedicated Novell systems engineer; lower prices; a streamlined ordering process; and access to the Network Support Encyclopedia, a CD-ROM compilation of recent Novell introductions that is updated monthly.

"One of the main reasons we signed up for the program is to get a Novell engineer assigned to our account," Dubiel said. "We felt we needed it to get a better response to our problems."

Client/server

Intersolv boosts Excelerator, adds road map

By Melinda-Carol Ballou
WASHINGTON, D.C.

Intersolv, Inc. is sallying into the client/server analysis and design market with a version of its Excelerator tool that adds a new diagram editor, support for data-, process- and event-driven design and links to relational database management systems.

Also new with Excelerator II is an application guide that provides users with a road map into the morass of client/server development.

During the past several months, the Rockville, Md. company has received attention from Powersoft Corp. and Gupta Corp. Both client/server tool specialists are seeking group development support and have announced links between Intersolv's PVCS version control product and their development products.

Intersolv Chief Executive Officer Kevin Burns said the relationships make sense because users require both high-end development and the ability to mix client/server and legacy applications. "Everyone's focused on client/server graphical development and has lulled themselves into thinking that team development, control and scalability are not required," he said.

Burns said he hopes Excelerator II will change that thinking by taking these concepts one step further. The package addresses the performance and usability issues that concerned users of the earlier release.

Computer-aided software engineering (CASE) "is not dead; it just has to change, and Excelerator II is an example of that," said Ed Arly, director of software at International Data Corp., a Framingham, Mass., consultancy. "It's a definite misconception that you no longer need to do CASE. You still need to do business analysis and structured design."

But will Excelerator II get the nod? "For people who are still deciding [about CASE tools], it's a 'me too' announcement. But [Intersolv is] finally positioning itself to take a place in this market," said Peggy Ledvina, an analyst at Meta Group, Inc., a consulting firm in Stanford, Conn.

Thumbs-up

Users were positive in their assessments of the new version of Excelerator.

Pennzoil Co., a Houston-based petrochemical company, performed a 75-point evaluation of a half-dozen tools after scanning the market. It opted for Excelerator II because of the tool's repository and because it allows groups of programmers to share objects. While Pennzoil said it appreciates the performance improvements in Excelerator II, the root cause of the release is a rewritten diagram editor that fixed problems in the old editor, according to Debra Marinelli, manager of data administration.

"The old editor required a lot of work on the part of the user. [Intersolv] totally rewrote it, knowing what to avoid, and now we will be able to get work done a lot faster," she said.

Intersolv expects to ship a full object-oriented tool in November, officials said. Next year the company hopes to release server support for Microsoft Corp.'s Windows NT.

Excelerator II is shipping now and is priced at $6,500. Links to Powersoft and Gupta products will ship by year's end.

The future has to start somewhere.

We predict it will start in very close proximity to Motorola's PowerPC™ Microprocessors.

Here's why. Personal computers are on the verge of becoming infinitely more useful, more usable, more communicative and more mobile than they are today. A number of advanced technologies—real-time video, wireless networks, voice and handwriting recognition and object-oriented programming, among many others—are ripening, converging and becoming affordable all at once.

The one thing all those technologies need is extraordinary processing power. Processing power that only PowerPC Microprocessors can deliver.

In its various forms, the PowerPC microprocessor will provide the right combinations of high

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Feds urged to raise export limit on processing power

By Gary H. Anthes
WASHINGTON, D.C.

After years of waiting, computer makers are hoping the U.S. Department of Commerce will take a major step toward overhauling its 45-year-old export-control regimen this week. Industry has long contended that existing regulations,

which were conceived to keep powerful computers out of the hands of unfriendly weapons-builders, cost billions of dollars in lost sales and contribute little to national security.

However, industry expects the government to relax controls on many exports that must now undergo a laborious licensing procedure if a government re-

port slated for release Thursday finds that computers available from foreign makers exceed the power of censored U.S. units.

Last week, the American Electronics Association (AEA) called on the government to raise the threshold below which computers can be freely exported from the 12.5 million theoretical operations

per second (MTOPS) to 210 MTOPS. MTOPS is a government-devised measure of processing power. Few computers made in the U.S. today fall below 12.5 MTOPS, approximately the power of an Intel Corp. 1486-based PC.

The AEA quoted Commerce Department figures suggesting that 8,700 export-license applications last year worth $10.1 billion would have been freed up under the 210 MTOPS threshold. Billions more in export sales may be lost to smaller companies that are unwilling or unable to fight the export bureaucracy, the AEA said.

Loosen up

The government is expected to raise the export ceiling from 12.5 MTOPS to 210 MTOPS.

U.S. microprocessors available for export.

	MTOPS
Intel i486, 33 MHz	12.5
Intel Pentium	67
Sun SPARC	66
DEC Alpha	135-250
PowerPC (Motorola/Apple/IBM)	67-107

Source: American Electronics Association

According to Sun Microsystems, Inc. Vice President Mike Morris, it takes just minutes for chip makers in Taiwan and Korea to add a motherboard with four Scalable Processor Architecture chips—which individually can be exported under current U.S. rules—to a chassis to produce a workstation rated at 206 MTOPS, or a machine 16.5 times more powerful than the finished models Sun may export (see chart).

MTOPS obsolescent

Greg Garcia, the AEA's manager of international trade affairs, said the Commerce Department recently told the AEA that it has found "foreign availability" above 12.5 MTOPS but has not said at what level it found the computers, nor has it indicated whether it plans to raise the 12.5 MTOPS threshold in any case.

Under current law, the performance limit for exports to friendly countries will be raised immediately to whatever level the Commerce Department finds to be generally available from foreign suppliers. For exports to the former Eastern Bloc countries and unfriendly states, the government could raise the export limit unilaterally, but it is more likely to do so only with the agreement of its closest allies.

But no matter what the export limit may be, Garcia said, the industry is troubled by the government's apparent refusal to anticipate imminent technological improvements.

"It's not rocket science," he said. "You can look at industry trends; you can look at chip shipments and see that computers using those chips will be available [in foreign countries] a few months later. The government is constantly looking in a rearview mirror."
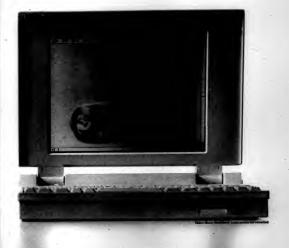
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Innovative input

Will interactive mice and voice recognition kill the keyboard?

By Stephen P. Klett Jr.

Although the bulk of industry resources and energies has focused on developing the fastest microprocessor or slickest operating system, more and more mindshare is turning to the evolution of the computer interface.

Advancements in the areas of input devices, voice processing and virtual reality could lead to fundamental changes in the way humans and computers interact.

"The technological battlefield of the future will be adding layers between the user and the raw machine to make the interface as invisible as possible," said Pierluigi Zappacosta, president and founder of mouse pioneer Logitech, Inc. in Fremont, Calif.

Logitech's Cyberman detects motion in six directions and provides output as well as input, such as vibrations in an action computer game

Zappacosta believes the way the industry currently views interfaces — as a component between computer and user — is fundamentally wrong. This perception exists, he said, because technology has not advanced enough to look at it otherwise.

"In reality you don't want an interface," Zappacosta said. "For example, I often refer to my son as a 'nice boy with a difficult user interface.' Get rid of the interface and all you have is a nice boy."

Logitech released the first sound-activated trackball roughly three years ago and a three-dimensional mouse and eye-tracking device for high-end workstations used for engineering applications last year. Last week, the company started shipping Cyberman, the first 3-D mouse aimed at low-end users.

Marketed as an interactive gaming tool, Cyberman detects motion in six directions: x, y, z, pitch, yaw and roll. The device is also unique in that it offers output as well as input. For instance, it provides tactile feedback in the form of vibrations that can be linked to events in software. Sensations such as being shot or hitting a wall in a game can now be felt as well as heard.

"It's amazing when you think that our most advanced supercomputers still rely on an input device (the keyboard) invented in the 1800s," said John Oberteuffer, president of Voice Information Associates, Inc. in Lexington, Mass.

"The key element in the evolution of the interface is the integration of different input modalities," Oberteuffer said. He said he believes advancements in input devices and speech technology will combine to replace the keyboard as the input device of choice, possibly within the next 10 years.

Not so easily disposed of

However, the industry differs on how long the keyboard will reign as the No. 1 input device. Sharad Singhal, director of speech recognition research at Bell Communications Research Corp. in Livingston, N.J., says he does not believe the keyboard can be so easily replaced.

"You'd have to add significant functionality beyond the keyboard and mouse — such as a single voice command able to perform an operation requiring a complex sequence of keystrokes," Singhal said. "But as a direct replacement for the keyboard and mouse, I do not see much use for voice for a while yet."

Oberteuffer acknowledged that the industry has to overcome the perception "that voice is the wave of the future and always will be." But he pointed to explosive revenue growth in the voice market as a sign of success. For example, he projects the value of the automatic speech recognition market to reach $647 million by 1997, up from $159 million in 1992 and $47 million in 1988.

Oberteuffer listed price — a basic speech recognition system costs about $5,000 — and accuracy as the primary factors keeping people from embracing the technology. "Price is coming down rapidly, but the trouble of finding an application that is powerful

enough for people to overlook accuracy problems remains," he said.

Meanwhile, Zappacosta is watching for even more exotic means of interacting with computers.

For example, he recently tried out an eye-tracking system under development at a small firm in Palo Alto, Calif. The system uses electrodes to detect facial muscles' electrical impulses caused by eye movement and converts them into digital signals for input into a computer. For instance, when he looked to the left, the screen cursor moved left. While the system did not work as well as the average mouse, Zappacosta said it had "enormous potential."

In Japan, he said, research underway aims at enabling computers to distinguish between "yes" and "no" from human brainwaves.

"It's not so strange to think computers will allow us to make our next evolutionary step by expanding our brain power — we will become part of it and it part of us," Zappacosta said.

A number of developers, Logitech included, remain convinced that virtual reality represents the next evolutionary step for the interface. While also limited to entertainment use so far, virtual reality is creating a great deal of excitement as an interface, Zappacosta said.

"Virtual reality has raised the interface to the level of superstar," he said.

Speak up

Voice technology is expected to play a major role in the next wave of computer interfaces

Reverue from computer-related voice-technology sales

1992 total: $159.2M

Speech-to-text 22%
Telephone 27%
Data entry 22%
Consumer 13%
Computer control
Voice verification

1997 total: $647.0M

Speech-to-text 26%
Telephone 31%
Data entry 15%
Consumer 9%
Computer control 13%
Voice verification 6%

Source: Voice Information Associates, Lexington, Mass.

28 COMPUTERWORLD AUGUST 23, 1993

IBM introduces monitors that work with any PC.
Suddenly, things are looking better all over.

When Computerworld
new software, who

's Premier 100 develop
keeps them on top?

Baby giants

I'm not that old, honest, but I do remember a time when talking long distance was a really big deal. You'd call someone, and an office assistant would say, "Sorry, I can't interrupt because she's on a long-distance call." Read: This is an important call. An expensive call.

That was in the days when there was only one communications company. Very few people called it by its real name, the American Telephone and Telegraph Co., or by its old letters, AT&T. No, to most folks it was just the phone company. *The* phone company. Every non-innovative megalith that naturally added up all its costs and then negotiated a rate that guaranteed a return to its investors, whether the company was efficient or not. It was not.

Enter the feds in 1981.

Against strident opposition from the phone company, the government 1) broke apart the megalith into a long-distance piece and seven local service pieces and 2) created a landscape that fostered competition.

The rest, as they say, is history. During the 1980s, competition flourished, rates nosedived, services expanded exponentially, and everyone got telling these services made plenty of money.

Soon the federal regulators will consider actions that will further spur competition and expansion of telecommunications services. No, I'm not talking about the approval of AT&T's purchase of McCaw Cellular. That's going to be a no-brainer that, long term, will do more than any other single event to promote the reality of the virtual office.

Instead, the seven Baby Bells, which are hardly babies, will want to compete in the long-distance market, and they will also want to have the restrictions lifted forbidding them from manufacturing hardware.

If there's one lesson to learn from the past, it is that competition flourishes when there's money on the table. And no one can doubt the value of competition to the consumer.

And if there's a lesson to learn about the future, it is that the future is going to be wireless. The Baby Bells justifiably fear their franchises failing prey to local wireless providers such as AT&T — maybe not tomorrow but certainly by decade's end. Such fears are not groundless.

AT&T is a far better company today than it was a decade ago because of competition, not despite it. It can and will play a major role in the development of the "national data highway" concepts (certainly better than the federal government).

Bill Laberis

Bill Laberis, *Editor in chief*

Take it slow

OOP objections

After reading Charles Babcock's article "Relational backlash" [CW, June 28] and C. J. Date's previous article, "A fruitful union" [CW, June 14], about the merits of object vs. relational DBMS, it is my opinion that neither Mr. Date nor Mr. Babcock is completely correct.

The bottom line is not whether one technology is better, but which technology best supports the requirements of the system being developed.

I do agree with Mr. Date's statement that "relational vendors should do everything within their power to extend their systems to include proper domain support." However, his assertion that this would allow relational systems to do everything object-oriented DBMSs are capable of just isn't true: A domain and an object class are not the same!

True domain support would still not allow the complex data types found in object-oriented systems. It would also not provide a mechanism for defining the valid methods for an object class. It would also not support object class hierarchies, which are the foundation of an object-oriented approach.

Mr. Date's suggestion that relational is the better technology because it has a solid theoretical foundation and object oriented does not is not a valid point. Object oriented may not have the same mathematical foundation; however, it's a more natural representation of the way people think and organize objects in the real world.

James R. Barnett
Deerfield, Ill.

Jilting a gender?

Regarding Pamela J. Steele's letter in the July 26 issue: I am sick of the current obsession with "political correctness."

Anyone who gets so riled over some imagined slight in *Computerworld's* use of "be" rather than "he/she" or use of necktie-wearing men to symbolize high-technology workers has a self-image problem (hey, I've been known to wear a tie on occasion!).

Ranting is great about this kind of trivia diverts attention from the truly important issues facing women in the workplace — like equal pay for equal work and promotion above the glass ceiling.

Using "she" instead of "he" isn't going to put these inequities right until we women prove our competence again and again, in large numbers and over time.

Wasting precious energies and time on trivial outbursts rather than working to correct the real problems only give ammunition for dismissing working women as a bunch of superficial whiners who don't deserve the equal consideration we demand.

Karen Goertzel
Herndon, Va.

A defect dilemma

Larry D. Range's article, " 'Do unto others' applies to us, too" [CW, July 26], makes a good point for testing software but misses another: Even the best "structured testing" is still inefficient.

Capers Jones reported in a paper in 1987 that the various "phases" of testing (unit, function, integration, system) have a defect-removal efficiency of around 25% per phase.

Obviously, the solution is to not put defects in in the first place. Failing this, we should remove them quickly through a "life-cycle" pattern of reviews, walk-throughs, Fagan-style inspections (which have a defect removal rate of more than 60%, per Capers' study) and thorough testing.

The bottom line is that developers must deliver systems with low-defect rates; they cannot depend on testers to find all the defects. That's just passing the buck.

Rodger Drabick
Eastman Kodak Co.
Rochester, N.Y.

NT: Not totally

Peter Shaw

I was going to title this editorial "NT: No thanks," but that would have been hypercritical. NT is not the villain. It is the cry, "only NT," that is troublesome.

Still, if adopting NT means forfeiting all the advantages of proven technologies and making all our operating system software dependent on a single shop (Microsoft or anyone else), then we *should* say, "No thanks." It makes no sense to throw away what's been achieved in IS' long fight for open systems.

We need to stay open, so we never have to see press announcements like the following:

• REDMOND, WASH. — Microsoft today announced further cuts in development system support for NT applications from competitive software companies. "By limiting the ability of outsiders to 'screw around' with our software, we can assure a better computing environment for everyone," said a Microsoft spokesperson.

• WASHINGTON, D.C. — Under intense pressure from Redmond-based lobbyists, the federal government today moved to replace Posix requirements with a new specification patterned closely after an internal Microsoft specification. A government spokesperson said, "We cannot afford the risk of major systems errors in mission-critical applications by trying to maintain an open systems environment without Microsoft's endorsement."

There is a better way. We can insist on maintaining an open environment in which heterogeneous systems efficiently communicate, interact and support one another. And we can use the X Window System protocol as the basis for open computing.

NT has been called the "killer of the X Window System." *Nice try.*

The idea of comparing X to NT is ludicrous. X doesn't claim, nor does it aspire to be, an operating system. By the same token, NT isn't a distributed, multiplatform graphical environment that is operating system-, network- and hardware-independent. X currently runs not just on Unix, but on DEC's VMS and IBM's MVS; not just on TCP/IP, but on Novell's IPX/SPX. It can be used on hardware platforms ranging from 80386-based PCs to supercomputers. Now that's what I call open!

NT can play in this sandbox. But, depending solely on NT would be like being stuck in the sandbox without a pail, shovel or even any sand. NT and X, however, is a different story.

X and NT can and will complement one another. X industry vendors have recognized NT's open systems shortcomings and are developing products to allow NT to participate in the whole world, not just the Microsoft world. Implementations of X for Microsoft will allow NT (and Windows) systems to access Unix, as well as other open systems applications.

Let's not confuse "dominant" with "open." Microsoft, with its Windows and future NT products, may become dominant, but it certainly won't be open. History has shown us that dominance hinders, while openness fosters rapid improvements.

Let's keep our industry growing. NT you, but *not totally.*

Shaw, president and chief executive officer of AGE Logic, Inc. in San Diego, serves as treasurer and secretary of the X Industry Association.

Where's CASE when we need it?

FIRE WATCH by John Gantz

I recently participated in a workshop on client/server application development for medium- and large-scale IS organizations. What I saw and heard convinced me that in our eagerness to adopt new client/server development tools, we're moving into uncharted waters and may sail right off the edge of the earth.

The crux of the problem is that structured development tools and CASE technology useful for large-scale applications don't readily lend themselves to client/server applications. And the current crop of client/server development tools, such as PowerBuilder from Powersoft Corp. and Visual Basic from Microsoft, don't lend themselves to large-scale applications.

Complicating the issue is the fact that CASE technology — the methodology-heavy stuff — is in disrepute right now, while the point-and-click development tools are hotter than a match head.

Question is, how many people can this gap get burned?

At the workshop, an IS manager from a manufacturing company told of a major order-entry and order-tracking application built in six weeks using PowerBuilder, a relational database and a couple of RISC-based Unix boxes.

The original spec for the project, based on traditional Cobol development tools and conventional thinking, was 10 to 14 months. But pressure from the top caused the IS group to rethink that approach and led to radical change. Parts of the application were developed overzealously. Testing was started before design and coding were complete. Training started before the application was done, etc. The development prototype became the system. And, oh yes, the project team put in superhuman hours.

This was clearly an example of a breakthrough approach and a major success story. But for how long?

The IS manager was an evangelist for visual development tools and rapid prototyping, admitted after the meeting that he wasn't sure how maintainable the application would be. At the moment he didn't care. The system has been running for six months, top brass is happy, he got his next promotion, he is six-to-eight-figures deep in the weeds, and if he had to do it all over again, he would.

Nobody wants to hear about costs that might occur two years down the line because an application was designed with a particular type of development tool and without detailed organization or process modeling. And nobody wants to wait around while vendors figure out how to blend the best of CASE with the best of client/server development tools or work their way toward agreement on the Portable Common Tools Environment. There's too much pressure from above to come up with short-term solutions.

Fair enough, but what that means is a lot of organizations are going to run into big problems. About the time they fully wean themselves from the painstaking methodical application-development process — the one with 24-month backlogs — they'll start seeing some of the fruits of their early fast-track projects crash and burn.

When that happens there will be much gnashing of teeth, second-guessing of past choices and fretting over careers. And the phrase, "managing without expectations" will take on a whole new meaning.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

Charles Babcock

The smart subsystem

If powerful PCs are ever going to live up to their potential, they will need an I/O interface like SCSI. The Small Computer Systems Interface is one of the few standard technologies to move out of the domain of minicomputers and workstations down to PC turf.

The move hasn't been a smooth one. SCSI devices still cost more than the I/O devices IOS is geared to handle — the Enhanced Small Device Interface or integrated drive electronics disks. And, because of the lack of PC operating system support, SCSI devices require drivers.

On the other hand, SCSI has evolved beyond the SCSI-1 stage that followed its adoption as an ANSI standard in 1986. At that time vendors embraced different portions of the SCSI command set in their device drivers while claiming to be SCSI-compliant. Hence, two different SCSI peripherals might not work with the same SCSI expansion card (or host adapter, as it is known in the minicomputer world).

Sensing that user frustration was building, suppliers of SCSI-1 devices finally got together to seek greater compatibility, according to Mike Casey, vice president of storage industry research at Computer Intelligence/Infocorp in Santa Clara, Calif. Most incompatibilities have disappeared with today's SCSI-2 devices.

In addition, a part of the SCSI-2 standard known as Fast SCSI doubled the data transfer rate from 5M to 10M byte/sec., while Wide SCSI increased the data path from 8 to 16 or 32 bits. Teaming up Fast and Wide SCSI over a 32-bit path yields a 40M byte/sec. transfer rate, a bandwidth that can stand up to the heaviest demands of PC applications.

SCSI is now one of those technologies that allows you to start small and scale up to the system you want. Starting from a single disk drive, a SCSI-equipped PC could add up to seven peripherals of various kinds — say, a mix of disk drives, a CD-ROM, rewritable optical and tape. SCSI may one day be a requirement rather than an option for PCs to be multimedia-proficient. It's also possible for one of the peripherals to be a secondary SCSI adapter, allowing another seven devices to be nested in the control of the primary adapter. (Caveat emptor: A little custom programming is required to do this.)

In the meantime, buyers with an eye to longevity might be wise to consider SCSI as the I/O bus of choice for the more powerful PCs they purchase. Unlike standard PC peripherals, SCSI devices are bi-

directional — they can send and receive commands through the host adapter.

SCSI thus allows greater use of the multithreading, multitasking power of the 32-bit operating system. An OS/2 or Windows NT. The operating system can handle requests from several different devices attached to the host bus at the same time. Or the operating system can process several commands to the devices, feeding them into the host adapter at one time, instead of sending one command and waiting for a reply.

And the 32-bit power is more fully realized with desktop Unix — Solaris, Univ-Ware and the Santa Cruz Operation's Open Desktop — as support for SCSI is built into the operating system kernel. Special drivers do not need to be added.

The Macintosh is one of the few examples where SCSI is standard across the product line. The SCSI underpinning is one of the reasons why Macintosh applications work together more consistently

than those in the DOS/Windows world, Casey said.

Buying into SCSI for Intel-based PCs is more expensive initially — a Fast SCSI hard disk drive will cost $200 or $220 more than a non-SCSI drive. But what the extra money buys is a more intelligent subsystem that is better able to support the needs of the desktop of the future.

Babcock is Computerworld's *technical editor. His MCI Mail address is 575-2237.*

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Cyrix ups power of PC

Pop-in chips simplify upgrading from 386 performance to 486

By Michael Fitzgerald
RICHARDSON, TEXAS

■ The 6 million-plus installed base of Intel Corp. 80x86DX-type PCs has kept Cyrix Corp. busily pursuing a way for users to upgrade these machines to a 486-class power simply by popping in a new chip.

Cyrix has been after this market for about a year and a half, introducing a variety of chips on a board to try to claim the market. Its newly announced CX486DR2 chip is a step simpler than its predecessors because it simply pops into the socket of a 386DX chip that runs at 16, 20 or 25 MHz. The chip will not perform a similar function for Advanced Micro Devices, Inc.'s Intel clones because they are soldered on the motherboard.

The new Cyrix chip has three versions: a 16/32-MHz version for $299, a 20/40-MHz version for $349 and a 25/50-MHz version for $399. These will be available from retail stores or Xerox Corp.'s Customer Service Organization.

Cyrix claims the chips will out-

perform the ones they replace by 1.7 to 2.7 times, depending on the application.

Beta-test users who have been working with the Cyrix chip (technology for almost a year said Cyrix has satisfied their concerns with the DRX2 chips.

Eric LaFortune, regional electronic systems coordinator at a large petroleum firm, has been involved in Cyrix's beta-test program since it started and called the new chip "outstanding — I haven't been able to get this new version to go down at all; I could get every version down except this one." LaFortune said he has already installed 50 Cyrix upgrades and has another 50 on order.

Another beta-test user, John Woods, a PC systems specialist at Chevron Information Technology Co., the information systems division of Chevron U.S.A., Inc. in San Ramon, Calif., said the new chip fixed a problem that had stopped him from using the previous daughterboard versions of the chips.

On motherboards without clearance, the old way wouldn't fit,

and it constrained our ability to install them," Woods said.

Woods added that he expects Chevron's user departments to order at least 200 chips and perhaps as many as 2,000.

Woods and LaFortune cited the same reason for switching the Cyrix chip upgrade: getting 386 users up to 486 performance without buying a new 486-based system.

"It's a quick, easy and cheap way for me to get my users up to basically a 25-MHz 486SX environment," LaFortune said. "It costs me $500 to $600 to go out and buy a new 486-based motherboard, and this is half that."

Woods said some of the machines that Chevron has purchased are an eight-year depreciation cycles, which makes the chip upgrade a helpful way to improve the machines while keeping them on the books.

James Chapman, vice president of marketing at Cyrix, said the company has sold 20,000 of the upgrades. This leaves Cyrix well short of its goals for the chip, though Chapman said that if even 1% of 386 users upgrade, "it's a vi-

able product for us."

Cyrix said its strained relationship with Texas Instruments, Inc. will not affect its ability to supply the DRX2 upgrade because SGS-Thomson Microelectronics will be building the chips for it.

Chapman also said Cyrix hopes by Christmas to have a chip that will allow the vast market of 386SXs to upgrade. Cyrix has a prototype now that includes a mechanical adapter that will let the SX upgrade clamp down on top of a system's 386SX, most of which were soldered onto the motherboards. The Cyrix chip will disable the SX processor after it is clamped on.

Chip tricks

Tom Seigos, director of emerging technologies at Cyrix, developed the chip-level upgrade. He noted three issues that had to be overcome:

• Cache autonomy — the 386 chip did not have on-board cache.

• BIOS limiting — the upgrades no longer function.

• Clocking — doubling the internal speed sent the wrong signal to some boards.

Three steps

Cyrix says it takes only minutes to upgrade a 386-based PC to a 486

Step 1
Remove the 386DX microprocessor

Step 2
Place the Cyrix 486 microprocessor in the microprocessor socket.

Step 3
Press the Cyrix microprocessor in the microprocessor socket.

- CX486DR2-16/32 for 386DX 16-MHz computers
- CX486DR2-20/40 for 386DX 20-MHz computers
- CX486DR2-25/50 for 386DX 25-MHz computers

HP's OmniBook shows design innovation

By Garry Ray

There's something baffling about a notebook computer industry that can't get things right. Poor battery life, unreadable displays, bulky power supplies and inconvenient mouse substitutes are the dead ends that many notebook manufacturers can't seem to avoid.

And then there is Hewlett-Packard Co.'s OmniBook 300 subnotebook portable.

Released in June, the OmniBook 300 is another example from Palo Alto, Calif.-based HP that advanced engineering pays off. Although it is far from perfect, the OmniBook 300 is one of the most clever and innovative portable computers yet to be offered to the traveling user.

The OmniBook mouse to answer a single question: What could we do if the discarded dated PC notebook technology

and designed a portable unit around leading-edge components?

The answer is a 2.9-pound portable stuffed with software, including MS-DOS, Windows 3.1, Microsoft Corp.'s Word for Windows 2.0 and Excel 4.0 and Traveling Software, Inc.'s LapLink.

This software, along with HP's own Appointment Book, Phone Book and Financial Calculator, is packed into read-only memory, leaving the unit's 40M-byte hard disk or 10M-byte Personal Computer Memory Card International Association (PCMCIA) 2.0 flash disk available, for data and other applications.

There is a caveat: initial shipments of the OmniBook have produced a rash of problem reports, such as failed power supplies. Our unit did not have any problems.

Installation and configuration

Getting the OmniBook up and running is a snap. In the first minutes of use, we referred to the manual for only two rea-

sons: to determine the proper placement of the rechargeable nickel-cadmium battery pack (one can use standard AA batteries with the flash card unit), and to align the mouse pointer on the Windows display. Other than that, configuring the OmniBook is intuitive and straightforward.

The OmniBook mouse is a unique design solution to the mouse-pointing problems wrought by Windows. While most portable manufacturers have been building awkward trackballs into their notebook housings and keyboards, HP designed a more-or-less standard mouse

that is permanently affixed to the OmniBook case. To use HP's pointer, you press a button that releases the mouse from the housing, use two simple motions to align the pointer on the Windows desktop and begin to work with a device that feels more or less like a standard desktop mouse.

Configuring and using the embedded LapLink Remote Access software was not so simple, although it certainly is not beyond the ken of any savvy PC user. Although HP did not originally offer an external floppy disk drive for file transfer and storage, one is apparently in the works. It was not available at the time of this review.

For the time being, then, the fun begins after connecting the OmniBook to a desktop system with an included serial cable. Additional twiddling is needed to install the LapLink remote software module on the desktop PC. Once installed, the desktop system and the OmniBook can be placed in communication mode with a single mouse click, with all drives (including logical network drives) appearing as physical drives on the OmniBook.

Unfortunately, the OmniBook

HP's OmniBook takes advantage of leading-edge components

Carol Patton

Growing pains

Evolution is hell, especially in the software business. Take the case of Polaris Software in San Diego and Packrat, its personal information manager.

Packrat is a powerful Windows 3.1 tool that couples time and billing features with schedulers and telephone lists. Polaris shipped its much vaunted 5.0 Rat upgrade in mid-July.

Almost immediately, there were problems: Users were losing data whenever Packrat compressed files. Some lost ad-dresses and phone numbers at random; others lost everything their Packrat files contained. When the backup files (the ones placed in \Packrat\backup) were used to restart the program, even those records were gone. Between Packrat's newfound ability to corrupt program files and its appetite for devouring compressed data, the upgrade had become a disaster.

What do you do when your only happy customer is someone whose upgrade was lost in the mail? Polaris founder Jack Leach decided to stop shipping and fix his product fast. It took guts, but Leach did the ethical thing, hoping to minimize damage.

In late July, Polaris shipped maintenance upgrade "D," which should correct all the problems.

The Packrat debacle is every developer's nightmare. In Polaris' case, the timing couldn't have been worse. New entries such as Ecco from Arabesque Software in Bellevue, Wash., and Commence from Jensen-Jones in Red Bank, N.J., are heating up competition in the Windows personal information manager arena.

In fact, Packrat 5.0 isn't an upgrade at all, but a next-generation product that introduces a paradigm shift to object-oriented technology. Will Polaris be forgiven for an overly ambitious thrust at the edge of the envelope? My guess is yes.

Less than perfect

Revolution is also hell. Take, for example, a brand new product category — digital publishing. Several products can now translate (and transmit) entire typeset documents across different kinds of computers. Unfortunately, what you get at the other end is just a bit-map — printable but not editable.

For example, the role of Acrobat from Adobe Systems in Mountain View, Calif., and Common Ground from No Hands Software in Belmont, Calif. — currently on the Macintosh platform but coming to Windows — is turning the document's fonts into your fonts. Unfortunately, performance is slow and the size of the files produced makes them impractical for reproducing large documents.

Another problem: Fonts are rendered badly. Common Ground, for example, prints at 300 dot/in. but shows up on your screen at 72 dot/in. Although Common Ground offers a free viewer, there is no zoom feature and the page rendering is practically indecipherable. (Optometrist, anyone?) Acrobat's Reader is proprietary and pricey, a fact that will surely hobble its spread. (A single copy of Reader sells for about $50.)

Just how promising is this new area? With Hypertext extensions in the wings, it is very promising. But there is one caveat: Microsoft's recently announced Windows at Work architecture, which includes something called "smart" file transfers (planned for both Windows for Workgroups and Chicago), promises binary file transfers of TrueType documents at 300 dot/in. or greater. If this product is delivered, where is the market for Acrobat and Common Ground?

Evolution is painful, but as Charles Darwin observed, the alternative may be extinction. I prefer the observation of 18th century naturalist Chevalier de Lamarck. He believed birds don't fly because they have wings; rather, they have wings because they want to fly.

Patton is president of the Mendham Technology Group in Mendham, N.J., which produces two-day Client/Server Summits for corporate strategists. She is writing two books on computer software. Her MCI Mail address is 481-4869.

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Desktop ODBC access

Microsoft Corp. announced a set of Open Database Connectivity (ODBC) drivers to let Windows applications access desktop databases such as Access, Foxpro and other products that support ODBC formats. Targeted at third-party software makers, Desktop Database Drivers 1.0 will be available in several

weeks. The products will be priced at $49 each, Microsoft officials said.

Frankston joins Microsoft

Bob Frankston — one of the creators of VisiCalc, computing's first spreadsheet — has joined Microsoft's advanced technology group.

Windows NT on Unisys

Unisys Corp. announced that it will deliver Micro-

soft's Windows NT operating system for its PW2 PC customers by the end of next month.

Toshiba licenses PenRight

Toshiba America Information Systems, Inc. and AST Research, Inc. announced that Toshiba is licensing AST's PenRight operating environment for use in Toshiba's DynaPad T100X pen-based computer. AST said the move will make more than 600 PenRight applications available to DynaPad users.

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OmniBook

software mandates that file transfers from one system to the other be performed through the poorly designed Microsoft File Manager, which does not support synchronization of remote and OmniBook drives. That is a strange omission for a diskless notebook system. Nonetheless, the method does work once properly configured.

Performance

With its 3.3V 386SXLV processor running at 20 MHz, the OmniBook seems merely to zip energy from the AA battery set. We were able to operate the unit for more than six hours with less than a 50% power drain, according to the built-in battery monitor. This is a notebook computer that would easily survive a red-eye flight from Boston to San Francisco.

Performance, especially in loading programs from ROM, was good, although a slightly slower processor might have produced unacceptable performance. Although we did not run any formal benchmark tests, performance of all applications (including some that we installed on the 40M-byte hard disk) was well within an acceptable range.

The OmniBook's 9-in. Video Graphics Array display is perhaps its only undeliverable feature. Although its 16 gray shades produce sharp and readable screen resolution, the non-backlit, reflective LCD screen does mandate regular adjustment of the screen.

The best advice is to use the notebook under a good background light. The alternative — a backlit LCD display with greater power consumption — would sharply reduce the unit's battery life.

Other power-savers enhance battery life. The unit's four PCMCIA Type II slots support a storage configuration of either a single 40M-byte hard disk or a 10M-byte flash card unit. Either option uses two of the four PCMCIA slots, leaving two slots for a modem or other device. The unit we tested did not have a modem or any of the OmniBook fax or communication software, which includes WinFax Lite, Microsoft Mail Remote and Dynacomm.

Though we have not covered all of the features here, the HP OmniBook is the forerunner of a new breed of portable subnotebook computers that will become pervasive in the next year or two. Well-engineered, thoughtfully designed and an able performer, it is one of the top choices for the traveling computer user.

Aircraft test data takes wing

McDonnell Douglas engineers record in-flight data on patchwork of systems

By James Daly
LONG BEACH, CALIF.

Any airline passenger who has ever pressed his nose to the window and looked earthward is sure of at least one thing: It's a long way down.

Aeronautics engineers performing experiments on new aircraft at Douglas Aircraft Co. also know that when test flights do not come back with the data they were sent into the wild blue yonder to gather, it is a long and expensive way back up.

That was one of the problems troubling the engineers at the Douglas Flight Test Center, a division of McDonnell Douglas Corp.

"We'd fly around to do our tests, then land and process the data down here," said engineer Richard Paul. "If we found that we didn't hit our data point quite right, we'd have to fly the next day and do the tests all over again," he added.

Paul and his co-workers are halfway through the 18-month test period for the MD80, a 155-passenger jet scheduled to be certified by the Federal Aviation Administration by the middle of next year. Flying a fast-grabbing jet like the portable MD80 — it demands 25,000 pounds of takeoff thrust — is an expensive process costing approximately $50,000 an hour, according to Paul.

Paul and his co-workers have added a real-time in-flight monitoring system to the racks and racks of test equipment already in the MD80 to make sure they come down with the information they were sent up to retrieve.

The Test Data Monitoring System (TDMS) is a homemade patchwork quilt of electronic components. At its heart is a Motorola, Inc. 68030-based system running a Unix derivative called Uniflex. An Apple Computer, Inc. PowerBook provides the interface for in-flight monitoring by flight engineers.

Monitor and record

Paul noted that glassy sheets of data are recorded during the flight testing of a new aircraft. Engineers in flight monitor and record on 1-in.-wide magnetic tape everything from flap movement to air speed to fuel consumption. To convert the data from analog format to digital and then analyze it, the flight test center has remained mainframe-oriented, using primarily Digital Equipment Corp. VAXs and MicroVAXs.

The TDMS provides sky pilots with a mobile way to use a computer interface without having to disconnect from a battery of mainframes. In designing the system, nator among all his host applications. Xmodem and Zmodem file transfer protocols were needed to access outside computer resources. The many repetitive tasks the flight center's engineers needed to perform made a serious scripting capability mandatory.

Paul opted for the Apple Macintosh and then set out to find a terminal emulation program that would speed his work.

In conducting his search, Paul noted that he had rigorous product specification requirements. VT100 emulation was essential because it was the common denominator

And having an Ethernet connection and a serial connection at the same time was also mandatory.

Paul and his engineers ultimately settled on the PacerTerm communications package from Pacer Software, Inc. It includes a time-saving feature called MiniWindows that allows in-flight engineers to stay logged on to two accounts simultaneously.

Down to earth

During the five- to six-hour test flights, in-flight engineers carefully monitor the TDMS to make sure that they are indeed gathering the information they were sent up to collect. The recorded magnetic tapes are still extensively scrutinized after test flights, but now the engineers know they have "hit their mark" before they return to earth, Paul said.

The TDMS has streamlined an already complicated testing process by improving both the accuracy of the data collected and the efficiency of the collection process. The result is that travelers may soon be viewing their luggage and settling into a brand new MD80.

"It keeps us on schedule," Paul said. "And that keeps all the engineers around here very happy."

MD80 at a glance

Specifications for the McDonnell Douglas MD80	
Number of passengers	153
Takeoff thrust	25,000 pounds
Length	152.6 ft.
Cargo space	1,300 cubic ft.
Flight range	2,650 miles
Average flight speed	500 mph
Power	Two International Aero Engine V2500 jet engines
Due date:	Mid- to late 1994

CW Chart: David S. Marshall

Select's success exceeds Microsoft's expectations

By Stephen P. Klett Jr.
SPOKANE, WASH.

Customers are reportedly jumping aboard the Microsoft Corp. Select bandwagon at a steady rate, indicating that the prospect of larger discounts is easing users' fears of a two-year commitment to Microsoft software.

Select, a volume-discount licensing program aimed at large corporate customers [CW, Feb. 1], had a roster of approximately 30 signed up when it debuted in February. It now boasts more than 200 customers worldwide, according to Craig Fiebig, Select program manager at Microsoft.

"The run rate of new licenses has far exceeded our early expectations," Fiebig said. "Initially, we thought we'd have 100 to 150 agreements in the first year." Microsoft is signing one to two agreements per business day and now expects to have 150 more inked by year's end.

Select customers forecast how many units of a product they expect to buy during a two-year period. That figure is used to set pricing on a per-license or per-machine basis. Customers are given a discount classification based on the number of units they expect to purchase.

For example, customers who expect to buy 10,000 or more units are given the highest rating and are entitled to discounts of up to 70%.

Sole contact appealing

While Microsoft may be surprised by Select's rapid acceptance, industry analysts and users contacted said they are not.

"All indications are that the Select program has been a success, but there's no mystery as to why," said Matt Cain, an analyst at Meta Group, Inc. in Stamford, Conn.

Select's main attraction is that it eliminates the need for customers with multiple sites to negotiate deals with multiple vendors. Each firm deals with one "large-account reseller" (LAR), which gives each site, no matter how small, the collective bargaining power of the entire company, resulting in better discounts.

With Select, Xerox Corp. in Rochester, N.Y., which has forecast the need for 5,000 copies of Microsoft's Office suite during the next two years, is saving 30% to 60% over Microsoft's previous Extended Licensing Agreement (XLA) program, according to Dave Mindel, Xerox's manager of library services.

However, Mindel said perhaps the main reason Xerox went with Select was that it allowed the company "to avoid the word 'commitment.' No cash is required up front, and the worst that can happen if we don't meet our projections is that we don't get charged the lower discount bracket or dropped from the program, which is no big deal."

While customers said Select resulted in above-average discounts and greatly simplified license management, those with global operations were not totally pleased with the effort.

International expansion

W. R. Grace & Co. in Boca Raton, Fla., plans to purchase approximately 25,000 PCs, spread throughout 50 countries, during the next five years. Jesse Koontz, a corporate manager at W. R. Grace, said the company is currently negotiating the purchase of roughly 3,000 copies of Microsoft's Office under Select at a savings of more than 50% compared with XLA.

"However, in countries where LARs aren't identified yet, it is very difficult to buy under Select," Koontz said. "Microsoft is making efforts in this area, but we continue to grumble at them on a regular basis."

Microsoft currently has approved 100 LARs worldwide and is working to add to the list as quickly as possible, Fiebig said. He added that Microsoft is making changes for international customers in regard to pricing and distribution concerns, but he declined to give specifics.

According to Mindel, Xerox is working with Microsoft on a way to order licenses for its foreign sites through Xerox's U.S.-based LAR.

Handheld computing

Surveys predict slow start for handhelds, PDAs

By Michael Fitzgerald

A new survey predicts that today's minuscule market for handheld computers will reach $2.8 billion in sales by 1996. The principal applications for the personal digital assistants (PDA) reportedly will be communications-oriented and aimed at personal productivity.

Link Resources Corp./International Data Corp. (IDC) conducted a series of focus groups and interviewed 600 end

users for the survey. The survey predicts that businesses will be the first users of the new types of handheld devices, such as the AT&T EO Personal Communicator or Apple Computer, Inc.'s Newton, with a consumer market developing no earlier than late 1994.

Michael French, an analyst at Link, predicted four major uses for these devices:

- Sending and receiving phone calls.
- Keeping in touch.
- Schedule coordination.
- Minor document editing and annotation.

"Desk-based workers are largely creators of information, while mobile workers are not users of information," French

said. "They don't write reports while standing in front of a customer. They need to check facts."

While Link/IDC thinks the market for handheld devices will grow more than 50% a year, "these will not be an overnight sensation," cautioned Bruce Stephen, an analyst at IDC. "We're in the embryonic stage of market development right now, and currently there are competing platforms coming to market, in the form of subnotebooks."

A recent study of the market for PDAs by BIS Strategic Decisions in Norwell,

Mass., suggests a similar growth pattern for the handheld market, predicting that only 65,000 of these products will be sold in 1993.

Both studies pointed to a lack of actual hardware and software products as being a problem for PDAs in the early going.

Macintosh-like software for Windows unveiled

Claiming to have blurred the line between the Apple Computer, Inc. Macintosh and Microsoft Corp.'s Windows operating system, Granite Software, Inc. in Austin, Texas, has released a software package that gives Windows screens a Macintosh-like look and feel.

MeDesk for Windows Version 4.0 allows users to create buttons for any application or macro and arrange them around the screen. The interface features the familiar Macintosh trash can and, like the Macintosh, allows file names to exceed the DOS eight-character limit. It also provides some drag-and-drop features, such as the ability to print a file by dragging it to a printer icon.

MeDesk also features a library of more than 200 application icons, auto backup and restore, single-click disk drive access and automatic reopening of last-used files upon re-entry.

The product is a polished-up and renamed version of File Organizer, which sold about 10,000 copies in its first three releases.

MeDesk for Windows lists a retail price of $149.

— Paul Gillin

Avantos Performance Systems, Inc. has started shipping Release 2.0 of ManagePro for Windows, software for managers.

Advanced synchronization, cross-platform support, mobile user support and planning and organizational tools for the single user are included in this version. ManagePro 2.0 also features multiperson delegation, electronic-mail support and Dynamic Data Exchange support/Document Attachment.

An assistance window, coaching diagnostics and a new tool bar are also provided. ManagePro 2.0 for Windows costs $395.

▶ *Avantos Performance Systems*
Suite C
5900 Hollis St.
Emeryville, Calif. 94608
(510) 654-4600

Computer Associates International, Inc. is shipping updated modules in Version 6.1 of its ACCPAC Plus accounting package.

CA updated the Accounts Payable and Accounts Receivable modules. According to the company, Version 6.1 offers users a fully integrated multicurrency solution.

The product can revalue open transactions, enter transactions in any number of currencies and make inquiries and reports in source or home currency. Version 6.1 modules require an IBM PC or compatible, a hard drive, DOS 3.1 or higher, 640K bytes of random-access memory and Windowing System Manager Version 6.1A or higher.

The ACCPAC Plus accounting modules cost $795 each.

▶ *Computer Associates*
International
1 Computer Associates Plaza
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Microsoft Corp. has introduced Publisher 2.0, a desktop publishing application for Windows.

Microsoft said it added more than 25 features to this version. With the Publisher software, users can create newsletters, brochures, business forms and other types of professional-quality publications.

The product includes interactive templates called PageWizard design assistants that ask users design questions and can help develop a publication in minutes, the company said.

New graphics and design features such as a Clip Art gallery and irregular text wrap are also provided.

Microsoft's Publisher is available for an introductory price of $139 until Sept. 30. After that, the product will cost $199.
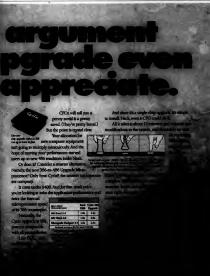
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Product shorts

CE Software Holdings, Inc. has announced QuickKeys 3.0, a new version of its QuickKeys desktop automation software. With QuickKeys, users can create shortcuts designed to automate frequently used actions in applications and in the Macintosh operating system. Cost: $169. CE Software Holdings, West Des Moines, Iowa. (515) 224-1995.... **Dow Jones Business Information Service** has introduced Market Monitor, an electronic source of financial and market information. Daily and historical news, quotes, analyses and forecasts are provided via a PC and a modem. Cost: $29.95 per month. Dow Jones Business Information Service, South Brunswick, N.J. (800) 520-4649.... **Spinnaker Software** has introduced the PFS:PowerAlbum for Windows, a product designed to provide users with a simple way to preview, organize and access clip art, images, scans and drawings. The product includes 1,000 color clip art images and provides image browsing and keyword indexing to speed image searches. Cost: $59.95. Spinnaker Software, Cambridge, Mass., (617) 494-1200.... **Strategic Mapping, Inc.** has announced MapMaker for Windows Version 1.1, a version of its Atlas MapMaker software program for IBM-compatible PCs running Windows. Improved graphics, new geographic point file support and refined interchanges with other programs have been incorporated with this release. Cost: $395. Strategic Mapping, Santa Clara, Calif. (408) 970-9600.

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Optical drives

Lower prices drive sales surge

By Stephen P. Klett Jr.

Declining hardware and media costs have sparked a dramatic increase in optical drive shipments, with CD-ROM drives the top seller, according to a recent study by Freeman Associates, Inc. in Santa Barbara, Calif.

Last year, shipments of CD-ROM, write-once and rewritable optical drives into the data storage market were up 119% compared with 1991 levels, and revenue was up 49%, the study said.

While more expensive than traditional storage products, optical drives offer users faster access, larger storage capacities and longer shelf life than both tape and magnetic media.

According to Freeman Associates, the optical disc drive industry shipped 2.6 million drives to data storage markets in 1992. More than 4.5 million units are expected to ship this year, a 70% growth rate. Demand is expected to be in excess of 11 million units by 1996.

CD-ROM drives will be the leader in shipment volume through 1996, with rewritable drives expected to move ahead of CD-ROM drives in revenue in 1997.

Price barrier removed

Price has been the main barrier standing in the way of CD-ROM technology. However, according to Robert Abraham, vice president of Freeman Associates, that barrier has been virtually eliminated.

"For $300 or $400 you can get a CD-ROM drive that is a real gem; for $600 to $700 you can get a top-of-the-line unit," Abraham said. "While [they are] still more expensive than traditional tape and magnetic drives, users are beginning to think that the performance benefits may be worth the expense."

In addition to price, Abraham said excite-

ment over multimedia, a steady flow of new CD-ROM titles and the declining costs of optical media have contributed to demand for CD-ROM.

Able to store multiple bytes of data, optical technology is particularly well-suited for storage and retrieval of imaged documents, which is clumsy and expensive to do via tape or magnetic disk.

	1992	1993*	1994*	1995*
CD-ROM	2,249	4,009	5,620	6,880
Rewritable	312	538	736	930
Write-once	41	35	36	44

Source: Freeman Associates, Inc., Santa Barbara, Calif.

For example, City Bank in Linwood, Wis., installed a 940M-byte, write-once optical drive from Panasonic Co. three years ago to replace a microfiche-based storage system. The drive connects to a host PC running an archiving software package called LaserArc from Premier Technologies in Portland, Ore.

Each day, the bank downloads a customer data file, which it archives to optical storage, from an NCR Corp. mainframe located at its service bureau in Milwaukee.

The result, according to Vice President Dan Coppin, is that the roughly 50 users on the bank's Novell, Inc. NetWare-based local-area network now have simultaneous, next-day access to the most up-to-date customer data possible.

Previously, "our service bureau made us a copy of the customer database on microfiche, which we didn't get for three to four days," Coppin said. "Now we have access to all customer information the next day, and we have the ability to produce the most accurate customer records possible, on demand."

Quick ROI

Coppin said the imaging system saves City Bank roughly $3,000 per month in processing costs associated with microfiche. "The system paid for itself in the first year," Coppin said.

While sales of write-once drives are projected to remain relatively flat, Abraham said that is due to users migrating to rewritable optical drives as their prices fall closer to write-once levels.

The worldwide market for all types of optical disk drives will approach $2.5 billion at OEM price levels in 1996, a 16% compound average growth rate from the $1 billion value of the 1992 market, according to the Freeman report. Projected revenue for 1996 is divided among the three major optical products as follows: $1.2 billion for rewritable drives (48% of total revenue); CD-ROM drives at $1 billion (42%); and write-once drives at $222 million (9%).

Jean S. Bozman

Planning for
NT *and* Unix

By now, you've read all about the marketing wars pitting Microsoft's Windows NT against Unix. It sounds like the billing for the fight of the century.

For IS managers who want one standard operating system, it may be just that. But for most sites, the shipment of Windows NT means it's finally time to roll up your sleeves and start planning to support Windows

Bozman, page 66

Utility seeks to standardize 20,000 PC users

By Michael Vizard
SAN FRANCISCO

The Pacific Gas & Electric Co. (PG&E) has created an information systems architecture that was designed to bring the company's office automation strategy in sync with its overall application development efforts.

According to Art Beckman, manager of client support systems at PG&E, the company's Information 2000 Development Model is intended to provide a road map for a distributed client/server model that will span the enterprise.

In contrast, Beckman noted that back-end operations and individual units within PG&E have tended to pursue their own strategies. But as the industry makes a concerted push to adopt client/server models, PG&E decided the time had come to adopt a single infrastructure.

"We had about three months of discussions with managers about what the goals should be, and then it took us about nine months to a year to build a strategy," Beckman said during the recent Groupware '93 symposium in San Jose, Calif.

Beckman said one of the primary benefits of creating an IS architecture is that it will help the com-

pany streamline a lot of the support costs incurred when each business unit creates its own standards.

"It's a major change in support. We want to drive out duplication so instead of having 100 help desks, we have plans to consolidate into one help desk," Beckman said.

The equipment

A key component of that strategy will be the enforcement of standards, which at PG&E will consist of 20,000 Intel Corp. i486-class PCs running Windows 3.1 and 450 servers running either Unix or OS/2. Microsoft Corp.'s Windows NT, meanwhile, is under evaluation.

On top of this base, PG&E has deployed the Vines network operating system from Banyan Systems, Inc., a variety of applications from Microsoft and more than 10 gateways that link departments to the central message handling services in Vines. PG&E also has SQL Server and Oracle databases running on its servers and DB2 running on an IBM mainframe.

In addition, PG&E has about 3,000 of its 20,000 PC users up on Notes from Lotus Development Corp.

"One of the reasons Notes has

PG&E, page 73

PG&E plans

First-generation application suite — DOS tools, file transfer

Client/server

Barnett banks on OS/2 LAN servers

By Mitch Betts
JACKSONVILLE, FLA.

The nightly backup routines that are taken for granted in the mainframe world are not so routine in the client/server world. When Barnett Banks, Inc. implemented its client/server system for international trade services, the bank's software contractor had to write its own nighttime support routines.

Now, without human intervention, the system runs its nightly batch jobs, backs up the database and shuts down the servers. By 8:30 p.m., it essentially goes to sleep.

At 4:00 the next morning, the main file server reboots, setting off a chain reaction that wakes up and refreshes other parts of the system so that users can log on and begin transaction processing at 7 a.m.

Taking care of these housekeeping chores automatically was just one of the challenges involved in the implementation of an OS/2-based system that features multiple servers, multiple local-area networks and links to Barnett's mainframe files.

The international trade system, developed by American Management Systems, Inc. (AMS), a software and services firm in Arlington, Va., went into service on May 3. It was the culmination of a two-year effort by AMS to transform TradeLine, its mainframe software product with 1.5 million lines of code, into a client/server product called MicroTradeLine.

The software automates much of the work involved in producing the "letters of credit" that smooth the way for high-risk international transactions. A second module, for processing international collections, is slated to be installed by November.

A central "engine" LAN in Jacksonville, Fla., running multiple database and transaction servers supports a remote-user LAN in Miami, with other user LANs to come.

Tangible payoff

Charles Piazza, vice president in charge of Barnett's international operations, said the new system cost the bank $800,000. He brushed aside questions about quantifiable benefits, saying the payoff is measured in the following business terms:

- Instead of paying chargeback fees for mainframe processing on a never-ending basis, Piazza said the client/server system has a one-time cost.
- Piazza said he likes the client/server system's scalability. As Barnett's international business picks up, and as the bank building company expands regionally, Piazza said he can just add more servers and PCs rather than pay for more mainframe processing.
- The system takes much of the "grunt work" out of creating letters of credit, Piazza said. Using a graphical user interface, staff members type the key parameters for a transaction into certain fields, and the software's built-in logic produces the boilerplate legal language with the details filled in.
- Piazza said he envisions the OS/2 system as the "platform of the future," capable of supporting future plans for a document imaging system.

Barnett took considerable risks by becoming the beta-test site for MicroTradeline. But Piazza said he has had a long and comfortable relationship with AMS. After all, he was the beta-test user for AMS' mainframe-based TradeLine system nearly a decade ago.

Even so, Piazza said his contract with AMS had an escape clause — which was never used — that "left the door open" to using the mainframe version if the client/server version never materialized.

City of the LANs

Barnett's wide-area network

Platinum expands downsizing arsenal

By Kim S. Nash
IRVINE, CALIF.

Platinum Software Corp. extended client/server financial offerings with three modules last week in a product line that, like that of rival Dun & Bradstreet Software, is standardized on Sybase, Inc.'s relational database.

Introduced a year ago, Platinum's Sequel to Platinum family is aimed squarely at mainframe downsizers, especially those users weighing alternatives to D&B Software, said Kevin Riegelsberger, executive vice president and co-founder of Platinum.

For example, in October, Clark Oil plans to ditch several mainframe-based financial systems from D&B Software for Sequel to Platinum applications. All but two of Platinum's [28?] Sequel to Platinum users plan to migrate or have already migrated off the mainframe, Riegelsberger said. (The two standouts are customers who have grown PC-based financial systems to a client/server environment, he said.)

The 9-year-old company extend-

Best-laid plans

Financial packages on the way from Platinum include the following:

- **Order entry**
- **Fourth-quarter 1993.**
- **Multicurrency general ledger.** Fourth-quarter 1993.
- **Fixed assets.** First-quarter 1994.
- **Purchase order.** First-quarter 1994.
- **Payroll.** Under development, no release date scheduled.

For the past three years, Platinum has funneled all research and development funds — about $25 million — into Sequel to Platinum, according to Kevin Bowling, senior vice president of marketing.

ed Sequel to Platinum with the following modules:

- **Sequel Publisher,** a report writer that can access databases, including those from Oracle Corp. and IBM.
- **Cash Management,** which was designed to integrate with accounts receivable and payable modules to reconcile cash and handle disbursements and receipts.

- **Inventory,** which helps users automate product counts and price change processes.

Prices range from $50,000 to $125,000, depending on the platform and number of users. Riegelsberger said $50,000 would buy enough for 10 to 20 users on low-end Unix workstations such as SPARC2s from Sun Microsystems, Inc.

The new components, available now, join five other Sequel to Platinum modules, including general ledger and accounts payable and receivable. Four other products are in beta testing. The line runs on OS/2, Microsoft Corp.'s Windows NT and Unix servers with OS/2 and Windows clients.

Sequel to Platinum runs native on Sybase's SQL Server database and relies on links and gateways from Sybase to access other relational databases, such as those from Oracle, Informix Software, Inc. and The ASK Group, Inc.'s Ingres Division.

Wyse fills in server line gaps

By Stephen P. Klett Jr.
SAN JOSE, CALIF.

Wyse Technology, Inc. recently started shipping its third-generation symmetric multiprocessing architecture to its OEM and value-added reseller channels. The firm also filled in some gaps in its server line, announcing a midrange uniprocessor server and potentialstallation of The Santa Cruz Operation's (SCO) Open Server Unix operating system on all of its systems.

Wyse's multiprocessing architecture is available in the form of chip sets, boards and full systems. Chip sets are available in three configurations starting at $800. A board set consisting of a system board, CPU board and error detection and correction memory board starts at $7,300. Wyse's Series 7000i Model

760MP scales up to five CPUs and starts at roughly $14,000. The Series 7000i Model 740MP scales up to three CPUs and costs approximately $10,100.

The Series 6000i Model 650 uniprocessor server is targeted at small and medium-size workgroups supporting up to 32 users. The system is based on the Extended-industry Standard Architecture bus and ships with an Intel Corp. 66-MHz 1486DX2 microprocessor. Base pricing starts at approximately $2,060.

Wyse will bundle SCO's Open Server 3.0 and SCO MPX Release 2.0 — the software extension to SCO Open Server that supports symmetric multiprocessing — on its Series 6000 and 7000 servers. It will also distribute and provide technical support for all other SCO products, including networking and development software.

Notes rival runs over TCP/IP networks

By Michael Vizard
HOUSTON

While Lotus Development Corp.'s Notes currently dominates the groupware platform, the ForeFront Group, Inc. has set sail on a course to compete with Lotus using a cross-platform groupware architecture developed at the Baylor College of Medicine.

Designed to run over Transmission Control Protocol/Internet Protocol, the object-oriented Virtual Notebook System (VNS) is a distributed client/server groupware platform that runs on Unix, Windows, OS/2 and Macintosh systems.

"We originally looked at Notes but decided to go with VNS because at the time we made the evaluation, Notes only ran on OS/2 servers, and we were looking for an open, Unix-based system that supported a client/server architecture," said Arno Jain, manager of engineering computers at British Petroleum of America (BP) in Cleveland.

Jain said BP is building some prototype applications on top of VNS that may be put into production in the coming year. In the meantime, Lotus is expected to deliver its first Unix implementations of Notes, but Jain said he still favors VNS over Notes.

Specifically, Jain noted that VNS supports real-time conferencing and provides an electronic scrapbook metaphor that is less structured than the templates associated with Notes applications.

"The real-time capability is really important when you're dealing with distributed around the world where you

only have maybe a two-hour window to communicate," Jain said.

In addition to these features, Fore-Front executives noted that VNS, unlike Notes, does not require sites to adopt a separate file format to support groupware. Instead, VNS applications can be stored in a standard Unix file format or as flat files attached to a SQL database.

In addition, the next release will support the storing of VNS documents as binary large objects directly in the kernel of a SQL database.

VNS users can also integrate third-party applications into VNS via an application programming interface or through a set of customizable hypertext links provided by ForeFront.

Notes is priced at $495 per server or client license, but Notes servers are limited in size to 1G byte. A VNS server has an unlimited storage message.

In the future, ForeFront plans to deliver VNS on top of Novell, Inc.'s IPX protocol and Digital Equipment Corp.'s DECnet. It will also support Windows NT from Microsoft Corp. as a server.

Pricing for VNS servers is $8,000 for an unlimited-size license. Windows and Macintosh clients are priced at $595.

NetServer breaks performance mark

Auspex Systems, Inc. announced that its NS 6000 NetServer broke the 2,000 operations mark, throughput barrier running Standard Performance Evaluation Corp.'s (SPEC) System File Server benchmark software suite.

The NS 6000 achieved a throughput rate of 2,037 SPECnfs operations/sec, with an average Network File System (NFS) response time of 46.5 msec. while managing eight Ethernet-based networks, Auspex said.

According to the firm, the performance level was achieved through its Functional Multiprocessing (FMP) architecture, which eliminates I/O bottlenecks by separating the network, file and disk management functions typically performed by the server's Unix processor. FMP allocates those operations to specialized processors so the Unix processor can perform system and network administration and database processing functions.

The SPEC System File Server software provides a standardized method for comparing NFS file server performance across different vendor platforms. — *Stephen P. Klett, Jr.*

DON'T BE EXPENSIVE

DELL 425s/L
i486 SX 25MHz SYSTEM
$1,499

- Business Lease: $55/MO.
- 4MB RAM
- 120MB (17ms) Hard Drive
- 3 ISA Expansion Slots
- Upgradeable to Pentium Technology
- Accelerated Local Bus Video
- SVGA 1024 Monitor (14", 1024 x 768, .28mm)
- One Diskette Drive (3.5" or 5.25")
- MS-DOS 6.0/Microsoft Windows 3.1/ Mouse
- High Performance Windows Drivers
- Embedded System Diagnostics

DELL 433/L
i486 DX 33MHz SYSTEM
$1,999

- Business Lease: $74/MO.
- 4MB RAM
- 170MB (17ms) Hard Drive
- 3 ISA Expansion Slots
- Upgradeable to Pentium Technology
- Accelerated Local Bus Video
- UltraScan 14C Monitor (14", 1024 x 768, .28mm, NI)
- One Diskette Drive (3.5" or 5.25")
- MS-DOS 6.0/Microsoft Windows 3.1/ Mouse
- High Performance Windows Drivers
- Embedded System Diagnostics

DELL 450/M
i486 DX2 50MHz SYSTEM
$2,899

- Business Lease: $107/MO.
- 8MB RAM
- 320MB (17ms) Hard Drive
- 6 ISA Expansion Slots
- Upgradeable to Pentium Technology
- Accelerated Local Bus Video with 1MB Video RAM
- UltraScan 15FS Monitor (15", 1024 x 768, .28mm, NI)
- One Diskette Drive (3.5" or 5.25")
- MS-DOS 6.0/Microsoft Windows 3.1/ Mouse
- High Performance Windows Drivers
- Embedded System Diagnostics

DELL 433s/L
i486 SX 33MHz SYSTEM
$1,799

- Business Lease: $67/MO.
- 4MB RAM
- 170MB (17ms) Hard Drive
- 3 ISA Expansion Slots
- Upgradeable to Pentium Technology
- Accelerated Local Bus Video
- UltraScan 14C Monitor (14", 1024 x 768, .28mm, NI)
- One Diskette Drive (3.5" or 5.25")
- MS-DOS 6.0/Microsoft Windows 3.1/ Mouse
- High Performance Windows Drivers
- Embedded System Diagnostics

DELL MULTIMEDIA 450/M
i486 DX2 50MHz SYSTEM
$2,498

- Business Lease: $92/MO.
- 4MB RAM
- 170MB (17ms) Hard Drive
- Upgradeable to Pentium Technology
- Accelerated Local Bus Video
- UltraScan 14C Monitor (14", 1024 x 768, .28mm, NI)
- One Diskette Drive (3.5" or 5.25")
- MS-DOS 6.0/Microsoft Windows 3.1/ Mouse
- Internal CD ROM
- High Performance Windows Drivers
- Embedded System Diagnostics

DELL 466/M
i486 DX2 66MHz SYSTEM
$3,199

- Business Lease: $118/MO.
- 8MB RAM
- 450MB (12ms) Hard Drive
- Upgradeable to Pentium Technology
- Accelerated Local Bus Video with 1MB Video RAM
- UltraScan 15FS Monitor (15", 1024 x 768, .28mm, NI)
- One Diskette Drive (3.5" or 5.25")
- MS-DOS 6.0/Microsoft Windows 3.1/ Mouse
- High Performance Windows Drivers
- Embedded System Diagnostics

Bozman

NT and Unix at different locations throughout your enterprise.

According to an International Data Corp. (IDC) report released in June, IS managers fully expect Unix to win out over Windows NT in the area of high-end data servers for the next year or two.

Their reasons: Unix is a mature, multitasking operating system with well-known strengths and weaknesses. It fits into a broad open systems infrastructure that was 20 years in the making.

By contrast, Windows NT is in its first release and, for now, lacks some utilities and interoperability features.

But users and business units, empowered by trends toward downsizing, are free to buy Windows NT and where they will. That represents the challenge

to IS because while Windows NT can live apart from Unix in an alternate universe of marketing and advertising, it cannot live in an alternate enterprise. It will live throughout your network.

Microsoft CEO Bill Gates begged the question of interoperability in his PC Expo speech in June when he said NT was a form of Unix [CW, July 5].

The IDC report said that of 150 sites surveyed, 32% planned to use Windows NT only for desktop applications and 15%

for LAN applications. Just 11% saw NT as a challenger to Unix as an enterprise-wide operating system. However, 49% of the same survey group said NT's lower cost of ownership was compelling in planning for future purchases, and 40% expect widespread availability of shrink-wrapped NT applications.

There are many ways for IS sites to accommodate Windows NT. For example, one can convert a local database server from Unix to Windows NT, or one can place NT servers on TCP/IP networks.

A third method would be to place Windows NT servers on Novell NetWare networks, but you may need special software to do so, according to Microsoft.

A fourth method, suggested by third-party vendors, would be to use X terminals to display both applications from NT and Unix servers on the same screen. That way, data and text could be transferred between X Windows using a cut-and-paste technique.

The path toward interoperability will not always be smooth, Microsoft admits. "Any time you put two or three complex systems together, there will be bumps to get over," said Collins Hemingway, a Microsoft spokesman. "We've been testing these [NT servers] with Unix systems to make sure they can communicate."

Microsoft already supports the TCP/IP networking standard out of the box, and it has limited support for the Posix and Sockets interfaces. But it does not have counterparts for "a whole boatload of utilities [Vmud] on many Unix systems," Hemingway said, and it is looking to third parties to provide equivalents for NT.

In an era when there will be open data highways linking corporate offices scattered around the globe, NT will need to add plenty of hooks into open systems standards. That may be one reason Microsoft is a member of the Object Management Group in Framingham, Mass. Objects can be used as electronic couriers to dissimilar systems.

As a matter of practicality, it may take two or three years for Windows NT to catch up to Unix in many re-engineering projects. Downsizing projects that required multitasking database servers and were specified before 1993 had no alternative to Unix, users say.

However, some IS managers believe they might have planned differently if Windows NT had shipped earlier. Future evaluations will, they say, include both Windows NT and Unix.

Bozman is Computerworld's senior West Coast editor.

White Paper

SOLARIS:

**Enabling
Enterprise Rightsizing**

Introduction

Just as the average American is sometimes painfully conscious of his or her weight, so too, it seems, is the average American corporation. While individuals slavishly work out in order to shed pounds, corporations are exercising various "resizing" approaches in an attempt to develop svelter profiles.

The corporate approach is largely fixed on downsizing and rightsizing, both of which are commonly associated with client-server computing architectures. Increasingly fueling those architectures, however, are the new generation of 32-bit operating systems such as IBM's OS/2 2.x, Microsoft's Windows NT and SunSoft's Solaris.

These 32-bit systems are ideal for downsizing mainframe and minicomputer applications onto networked desktop systems. They are also ideal for the client-server computing environments that are becoming so prevalent on today's information technology landscape. Client-server computing merges trends such as downsizing with the movement toward open systems and interoperability — first as part of Unix, now as a force on its own. It also incorporates the ever-increasing numbers of networks based on powerful, affordable microprocessor-based systems.

OS/2 2.x is an evolutionary step above the previous, non-32-bit OS/2 versions. It is a full 32-bit system that runs Windows applications and includes many features of other operating systems.

Windows NT, like OS/2 2.x, is a complete 32-bit operating system that incorporates the Windows interface. It is shipping first as a client, and then as a server operating system platform.

Solaris is more than just an operating system because it is packaged with ONC Networking and middleware tools such as OpenWindows and ToolTalk. While optimized for rightsizing application support, it also includes many new system management and base technology features such as symmetric multiprocessing, multithreading and installation tools. Solaris is scalable to support heterogeneous networks of up to tens of thousands of users.

Although SunSoft and Solaris have a lot of tough competition in the 32-bit operating system world, Solaris is a technically sound product that has a solid shot at carving out a significant portion of the market.

Information technology is an integral component of the corporate infrastructure. Computing does more than streamline a few isolated processes such as accounting or order entry transactions. The information network of an enterprise reflects, and in some instances helps determine, the corporate culture.

Because today's corporations compete more effectively and operate more efficiently with the critical assistance of information system technologies, computing now directly affects the ways in which a business functions and adapts. At the same time, business requirements place demands on information technology.

The belt tightening that has gripped U.S. corporations in recent years has directly impacted the data center and Information Systems (IS). Costly mainframe-dominated information infrastructures are being scrutinized. The convergence of low-priced, high-performance desktop hardware, 32-bit operating systems, open computing, and increased interoperability has offered corporations an appealing alternative: shift the focus of enterprise computing away from cen-

SOLARIS APPLICATIONS

A partial listing of the more than 8,000 Solaris Solutions.

Office Automation

Applix	(508) 870-0300
Aptech Systems	(206) 432-7855
Bluestone Consulting	(609) 737-4600
cc:Mail (A Division of Lotus Development	(415) 961-8800
Clarity Software	(415) 691-0320
Computer Resources	(603) 664-5811
Computer Support Corporation	(214) 661-8960
Digital Tools	(408) 366-6920
DISC	(916) 635-7300
Elan Computer Group	(415) 964-2200
FICOR	(512) 771-4466
Gain Technology	(415) 813-1800
Information Dynamics	(408) 370-1572
Island Graphics Corporation	(415) 491-1000
Lotus Development Corporation	(617) 577-8500
MicroCord Corporation	(303) 447-3936
NET Information Systems	(206) 682-0060
NBN Computer Systems	(510) 734-9400
Pacific Microelectronics	(415) 948-6200
Productivity Computer Solutions	(412) 243-7627
Quadration Systems	(603) 464-1158
Qualix Group	(415) 572-0200
Software Co-Op	(908) 355-7700
TANTARA Technologies	(303) 347-2957
UniSolutions Associates	(310) 542-0068
Z-Code Software	(415) 499-8649

Desktop Tools

Apache Computer Agency	(908) 561-0105
Adobe Systems	(415) 961-4400
Airetech Corporation	(603) 883-0220
Alisys Corporation	(214) 680-2060
Andersen Consulting Foundation	(312) 580-0069
Apunix Computer Services	(619) 495-9229
Artificial Intelligence Atlanta	(404) 373-7515
Beacon Computer Services	(44058)2478888
BORLAND International	(408) 438-8400
BREAKaway Software	(415) 989-3600
CADENCE Design Systems	(408) 943-1234
Carkery Technology	(508) 970-5358
Certified Scientific Software	(617) 576-1610
CINCOM Systems	(513) 573-3400
CompuDyn	(416) 923-3585

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tralized processing to distributed architectures.

This technology has led to the creation of trends such as downsizing, rightsizing and client-server computing. Companies that downsize are migrating from expensive central processing platforms, usually mainframes, to alternative platforms of interconnected desktop processors and servers offering highly competitive price/performance.

Rightsizing is a term used to cover both downsizing and upsizing.

Users who downsize are not doing so simply to lessen their dependence on mainframe products and plans. Other factors also come into play. The primary one is cutting costs, but improving end user support and service is also important.

Unix has provided a viable platform for rightsizing. Among the biggest winners in this environment are the systems vendors, selling hardware and operating systems, and the relational database vendorssuch as Informix, Oracle and Sybase.

Together, Unix platforms and the relational database servers pioneered client-server computing. Both camps are being rewarded with increased revenues and a sense of legitimacy within user organizations.

Sun and Hewlett-Packard added features to improve performance and database access within their systems software. This in turn improves corporate information access.

This mutually-beneficial, coordinated Unix-database effort is rapidly developing the technologies necessary to link legacy databases with client-server environments.

32-BIT COMPUTING AS A DOWNSIZING PLATFORM

From the perspective of downsizing/rightsizing, 32-bit computing is the platform vehicle for client-server computing.
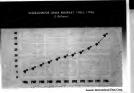
Conversely, 16-bit microprocessors are limited in their application support. For example, objects are limited to 64K bytes without additional programming. In this environment, programmers are forced to be aware of their memory architecture when designing applications, even if coding is in a high level language.

The 32-bit architecture enhances the process of downsizing mainframe and minicomputer applications onto single or networked desktop systems. As an integral part of that architecture, 32-bit operating systems and system software provide additional technology that supports memory management and better networking. The richness of the environment also enhances the ability to develop other technologies such as multimedia.

Unix database vendors are taking advantage of the need to link client-server architectures with database servers.

WORLDWIDE UNIX MARKET 1985–1996
($ Billions)

Source: International Data Corp.

As a primary platform for client-server computing, Unix is well-positioned to prosper for the next three years.

A COMPARISON OF VARIOUS OPERATING SYSTEMS

Sixteen-bit operating systems like DOS provide limited access to memory amounts above 64K bytes. The primary way to get around this is via segmentation.

Thirty-two bit operating systems have been around for years in the minicomputer and mainframe worlds. For instance, proprietary operating systems and many Unix versions have long taken advantage of 32-bit hardware capabilities. In the PC world, DOS was written to run on the Intel 8088 processor. As Intel expanded the family to the 8086, 286 and eventually the 32-bit 386 and 486, DOS stayed essentially the same.

Even though the hardware systems utilizing these new 32-bit chips were widely available, the software was not available from Microsoft.

The first operating systems that successfully incorporated the 386 and 486 chips were variations of Unix: Santa Cruz Operation and Interactive Systems (now part of Sun Microsystem's SunSoft subsidiary) were pioneers in this area. Additional versions from SunSoft (Solaris 2),

NeXT (NeXTStep), and Univel (UnixWare) have recently been introduced.

WINDOWS

Microsoft built Windows as an extension of the widely installed DOS operating system, greatly extending the life of DOS in the process. Windows is almost an operating system in itself — it provides not only a graphical user interface (GUI) but also memory management and rudimentary multitasking capabilities.

If DOS is a 16-bit operating system, then Windows is a hybrid 20-bit operating system built on a 16-bit core. While Windows is not perfect, it has provided a credible response to the Macintosh interface, which exposed the limitations of DOS.

OS/2 2.x

IBM's OS/2 2.x is an evolution of previous versions of OS/2 that were not 32-bit. Today's OS/2 2.x is a full 32-bit system that includes many of the features of other operating systems in addition to the ability to run Windows applications. OS/2 2.x, which is technically a fine operating

TICK

THIS MOMENT IN THE LIFE OF AN IT MANAGER IS ABOUT

TO BE SOLVED BY SOLARIS, THE OPERATING

ENVIRONMENT THAT CONNECTS THE ENTIRE ENTERPRISE.

SOLARIS APPLICATIONS

Desktop Tools (cont.)

SAS Institute	(919) 677-8000
Six Sigma CASE	(206) 643-6911
S.I. Corporation	(415) 927-1724
SoftQuad	(416) 239-4807
Software Artisans	(904) 372-8815
Software Moguls	(408) 748-8575
SPRING	33148705656
SPSS	(312) 329-3500
SunSolutions	(510) 960-1300
Sybase	(510) 596-3500
S.I. Systems	(403) 264-4343
Texas Instruments	(800) 336-5236
Time Arts	(707) 576-7722
Unifase Corporation	(510) 748-6145
Unify Corporation	(916) 928-6400
Virtual Prototypes	(514) 483-6712
Visdata	(510) 641-6400
V.I. Corporation	(413) 586-4144
WordPerfect Corporation	(800) 321-3280
WorldDesign	(206) 783-8630
XED Systems	(818) 407-4000
X.Solutions	440483502003

Business-Specific

Adra Systems	(508) 937-3700
Appleby Technologies	(201) 433-5580
Atlantic Microsystems	(703) 478-2764
AUTODESK	(415) 332-2344
Brainerson Corporation	(409) 364-7511
Cadkey	(203) 298-8888
Canoga Corporation	(313) 761-6550
CIMLINC	(708) 250-0090
Decision Software	(212) 385-1662
Dendrite Clinical Systems	(503) 292-3022
Hiblot, Karlsson & Sorensen	(401) 727-4200
HURInk	(614) 841-9677
INFINITY International Financial Technology	(615) 9404100
Intergraph Corporation	(205) 730-2000
Interlineer Technology	(415) 748-6850
Karell Data Products	(301) 937-8847
Marquette Electronics	(414) 355-5000
Metaphase Technology	(612) 482-4313
Microimages	(402) 477-9554
Mobile systems International	4471971 8199
Oasis Technology	(416) 886-2177

WORLDWIDE UNIX SYSTEMS MARKET 1991-1992
$ Millions

Source: International Data Corp.

Large-scale systems are clearly losers in the booming Unix systems market.

system, has had moderate commercial success to date.

WINDOWS NT

Like OS/2 2.x, Microsoft's NT is a complete 32-bit operating system that incorporates the Windows interface. NT will first be available as a client and then as a server operating system platform. Although NT has generated considerable interest, it is still an unproven product.

UNIX AND RIGHTSIZING: A NATURAL FIT

Unix fits into the interoperability mix as a link downward to DOS, Windows and OS/2. It also provides an upward link to the proprietary worlds of MVS and VMS. Achieving a high degree of interoperability is critical to fulfilling the promise of client-server computing because it gives users access to applications regardless of operating system environments.

Interoperability taken to its logical conclusion really means hardware and software independence, true application portability and transparent access to information.

The fastest growing segments of

the Unix hardware market are those embracing systems that are most often employed as rightsizing platforms: PCs, workstations, small-scale systems and workgroup servers.

SUN'S UNIQUE POSITION IN THE UNIX MARKET

Sun Microsystems and Sun have been very good for each other. Sun benefited when Unix provided the operating environment for Sun's pioneering RISC platform. And Unix benefited from the success and evangelism of Sun.

During planning for Unix System V Release 4 (SVR4), AT&T and Sun started to solidify their relationship. Wary of the potential fruits from that relationship, Sun rivals IBM, Digital and HP formed the Open Software Foundation (OSF).

Sun, AT&T and others responded by creating Unix International (UI), The Unix and Graphical User Interface wars followed. Although the Unix market prospered during these confrontations, it could have done even better.

Sun was extremely successful in exploiting a movement away from minicomputers to workstations in

1

the technical market. The company also capitalized on Unix and the concept of open systems in general.

It further created the perception that Unix was the best vehicle to implement open systems and developed and licensed the SPARC architecture, which allowed competitors to clone its machines.

SunSoft: SUN'S SYSTEM SOFTWARE COMPANY

The other major result of the AT&T/Sun alliance was Sun's decision to migrate from its early Berkeley Software Distribution-based SunOS to SVR4. In 1991, Sun broke up into several "planets" that each would focus on a particular opportunity. One such planet was Sun Microsystems Computer Corporation (SMCC), whose charter called for it to build and sell computer systems, including both workstations and servers.

As another spun-off planet, SunSoft was created with the intention of developing Sun's operating system software into a profitable business. One of the first things done by SunSoft was to announce Solaris as a SunSoft brand-name for its version of Unix.

In its efforts to sell system software, SunSoft targets hardware manufacturers. Naturally, SunSoft's largest customer is SMCC, but it also sells to the other hardware manufacturers that use the SPARC architecture.

SunSoft's market is not limited to SPARC. Solaris on Intel x86 is now shipping, and the company subsequently announced support for the PowerPC architec-

ture as well. This is consistent with the view that there will be three winning chip architectures — SPARC, PowerPC, and Intel x86 — and three winning operating systems — Solaris, Windows NT and OS/2.

SOLARIS: MORE THAN AN OPERATING SYSTEM

Solaris is more than an operating system because it is packaged with many other features that IDC calls "middleware." Examples include OpenWindows and ToolTalk. SunOS 4.x and its associated software were renamed Solaris 1, while SunOS 5.x and its associated software were called Solaris 2.

Solaris 2 represents a major technological step for SunSoft. While optimized for rightsizing application support, it also includes many new system management and base technology features such as symmetric multiprocessing, multithreading and security. It will be the basis for future object-oriented technology. Solaris 2 provides support for up to tens of thousands of users, an important requirement in the commercial server market. Solaris is compatible with

SUN'S POSITION IN THE WORLDWIDE UNIX MARKET

Source: International Data Corp.

Sun attributes its growth in the worldwide Unix market to its open technology.

Foxboro Company Links Executives, Manufacturing

For several years, manufacturers have been struggling to link two disparate worlds: the shop floor and the executive office. Both areas have been heavily automated for many years, yet in the traditional batch processing approach, information from the shop floor only reached the central processor periodically.

Six years ago, Foxboro Company, a worldwide provider of process control instruments, systems and services for manufacturers, embarked on a mission to resolve this predicament.

The ambitious task facing Foxboro, according to John Puckett, manager of worldwide engineering and network services, was the integration of its complete worldwide operations into a real-time, fault tolerant process control system. Foxboro, a division of Siebe PLC, is a worldwide operation with plants in the U.S., Europe and Canada, and offices throughout the world.

The project was conceived as a five-year plan and had a dual purpose. First, Foxboro was committed to integrating process control information into IS systems. This would connect the shop floor to the executive office, and, according to Puckett, "enable realtime, intelligent decisions." Second, Puckett and his colleagues from telecommunications, systems and applications replaced the firm's outdated IS system.

Two obstacles stood in the way of the company's goals. "Luckily, there was some cooperation in a handful of strategic locations, enabling the implementation to go forward.

The other obstacle was the network design. Eventually, Foxboro

determined that to develop an open architecture, it had to find new suppliers. As part of the evaluation process, it took an independent approach doing its own benchmarking and beta testing. The role played by Sun was crucial, and Sun's networking products, hardware and software largely determined the direction of the project.

For Foxboro, Sun offered the most coherent mix of hardware, applications and networking technology. The company decided on a networking architecture based on TCP/IP and Ethernet. It also implemented Solaris, the version of Unix offered by Sun's subsidiary, SunSoft.

Sun's ONC network architecture tied it together. As the network evolved, NFS and PC/NFS continued to allow Foxboro the ability to more easily bind systems together. But in Puckett's view, Solaris was the key to Foxboro's transformation.

Ultimately, Foxboro developed a solution based on Unix and ONC. Networking that created a seamless architecture called the Intelligent Automation System. This architecture now serves the entire corporation, connecting design, production, sales, shipping and field service.

Six years after the project began, Foxboro has all but eliminated its mainframes and proprietary minicomputers, and replaced them with client/server systems that include Sun, HP, and Digital Equipment servers and workstations. The Digital systems were first moved from VMS to Ultrix. Once the applications were moved to Ultrix, it became a short step to other Unix platforms.

SOLARIS APPLICATIONS

Technical Tools & Devices (cont.)	
Corollary	(714) 250-4040
Corporate Microsystems	(603) 448-5193
CellSYSTEMS	(408) 746-2190
Digital Multimedia	44081977 1105
DPT-Distributed Processing Technology	(407) 830-5522
DynaSoft	4687269560
Edinburgh Portable Compilers	4431 2256262
Enhanced Software Technologies	(602) 820-0042
Extended Systems	(208) 323-7575
G E T Engineering	(619) 443-8295
Glaspal Software	(215) 584-4261
Graexleaf Software	(214) 248-2561
GW Hannaway and Associates	(303) 440-9631
Harris EDA	(716) 924-9303
HiCOMP Storage Technologies	494063809-0
Highland Software	(415) 495-5567
Hunter Systems	(415) 424-9200
Information Management Co.	(908) 417-9770
Innovative System Applications	(206) 867-1315
Integral Solutions	4425688 2028
Intelligent Solutions	(904) 736-6820
Intelligent Software Solutions	(904) 736-6820
INTERSOLV	(301) 230-3200
IOtA	(619) 931-6350
Urban Corporation	(212) 753-2564
Logic Works	(609) 243-0088
Los Altos Technologies	(415) 949-4567
Media Vision	(510) 770-8600
Mentor Graphics Corporation	(503) 685-7000
Mesa Ridge Technologies	(619) 457-0570
Neuron Data	(415) 321-4496
MetaNet	(508) 655-2438
Objectivity	(415) 688-8000
Open Computing Security Group	(206) 882-8721
Q Star Technologies	(301) 762-9800
Quad Design Technology	(805) 988-8250
Raxksoil International	(805) 968-4265
Software Maintenance & Development Systems	(508) 369-7398
SQL/Within Software Company	(414) 780-7700
Sunburst Computers	(619) 633-1680
SunPro	(415) 960-7300
Sunrise Systems International	(401) 847-7868
Systems Engineering Corporation	(415) 962-8092
Technology Applications	(314) 394-6426
Technology Concepts	4463387 2611

SOLARIS APPLICATIONS

Technical Tools & Devices (cont.)

Template Software	(703) 318-1000
Thursby Software Systems	(817) 478-5070
Teleknew Technologies	(415) 441-0985
Tera Sawyer Software Corporation	(510) 848-0633
Transitional Technology Inc. (TTI)	(714) 693-7700
TWINCOM International	(516) 302-9936
UltraStor Corporation	(510) 623-8955
Viewlogic Systems	(508) 480-0881
VITAL	(713) 781-7406

Software Engineering

Abraxas Software	(503) 244-5253
AETECH	(619) 431-7714
Aggregate Computing	(612) 546-5579
Aleya	(805) 683-5777
Archelon	(519) 746-7925
BASIS	(510) 547-8900
Bradford Business Systems	(714) 859-4428
Intsnd Technology	(202) 438-6969
Cadre Technologies	(401) 351-5950
CADtools Systems Corporation	(408) 559-6240
Chen & Associates	(504) 928-5765
Compute Innovations	(908) 542-5920
DDC-1	(602) 275-7172
IntTech	(703) 641-0915
Interactive Development Environment	(415) 543-0900
Market Focus Technologies	(619) 546-6689
Mercury Interactive Corporation	(408) 987-0100
MetaWare	(408) 429-6382
Microprocessor Developments	(467) 1392577
Onsys	(617) 862-2002
Object Design	(617) 270-9797
Objective Interface Systems	(703) 264-1900
Quinton Software Systems	(415) 323-3111
Scandura Intelligent Systems	(215) 664-1207
Softools Corporation	(619) 457-2700
Stepstone Corporation	(203) 426-1875
Sunintigrate Technologies	(415) 390-8920
Tutorian Corporation	(415) 965-8050
Top Systems	(416) 781-3998
UniProm Software	(908) 287-2100
Viking Software Services	(918) 491-6144
Virtual Technologies	(703) 430-9247
Visible Systems	(617) 890-2273
Waterloo Maple Software	(519) 747-2373
Wild Hare Computer Systems	(303) 530-2221
Workstation Group	(708) 696-4800

the Windows, Macintosh and NetWare environments.

While an operating system kernel performs many mundane functions, it also is the basis upon which all other software (both system and application) resides, and therefore represents a potentially weak link. The greatest hardware system in the world is only as good as its operating system.

APPLICATION DEVELOPMENT ENABLERS

Solaris provides many features that facilitate the development of rightsizing applications. It is a modular operating system with loadable drivers for dynamic configurations and clean software-changes and additions. It is based on a modular programming model that discourages monolithic applications that are difficult to maintain and modify.

The modular programming model is based on network-transparent, protocol-neutral APIs. Solaris is also scalable, and applications running under it are binary-compatible on a wide range of hardware platforms, running from low-end workstations to 750+ transactions-per-second servers.

SunSoft's PLACE IN THE RIGHTSIZING MIX

Downsizing, the shift in emphasis from mainframe host environments to microprocessor-based systems, is rapidly taking hold. The continued development of client-server architectures and rightsizing requires commitments from vendors as well as IS and other enterprise entities.

Rightsizing projects will stretch client-server-related work beyond today's internetwork connectivity services and require additional skill sets which are currently in short supply. This will be a challenge for both vendors and users.

Solaris incorporates a wide range of Unix and enabling technologies.

Source: SunSoft, Inc.

The integration and interoperability of new technologies with older technologies is vital to the success of rightsizing.

SunSoft has developed a technically sound product, but translating technical success to commercial success is a daunting process. Customers are looking to outside experts to assist them in their rightsizing projects. Simply providing users with tools is not enough.

Given SunSoft's open architecture and support of interoperability, the company is positioned to become a market force in commercial rightsizing. The Solaris operating environment has increasingly been engineered to support distributed computing, but there are many more challenges to overcome. Solaris is poised to overcome those challenges. ∎

YOU CAN
TELL A LOT
ABOUT A
COMPANY
BY THE
COMPANY
IT KEEPS.

SOLARIS,
THE
OPERATING
PLATFORM
OF CHOICE,
PRESENTS
SOLARIS X86.

Utility

taken off on every desktop is because we already had an electronic-mail and bulletin board service installed that we still use. We tend to use it as a distributed database for tracking applications. And the officers like to use it for discussions," Beckman said.

Beckman noted that PG&E is looking at ways to consolidate the number of servers the company has to support and that PG&E's overall groupware strategy is being held back by a lack of E-mail standards.

"With groupware, each application creates a new set of standards and services. This is just a killer to the overall groupware environment because it presents an unusable environment that no one can administer," Beckman said.

At the same time, however, Beckman said groupware applications are too important to ignore at this point.

"It used to be that PG&E linemen, who are responsible for $100,000 trouble jobs, were managing those jobs based on six-week-old data from a mainframe. These people need to manage their jobs in real time," Beckman said.

By 1997, Beckman said he envisions a time when a gas service employee will be able to respond to bill inquiries by accessing a central server over a mobile terminal that will download data describing a customer's usage pattern. With this data, the employee will be able to schedule an energy audit and provide information on various payment plans.

By 2002, Beckman said he expects that the employee will be able to detect abnormal usage patterns and move to correct them before the customer's bill rises substantially.

To accomplish these goals, Beckman

said IS people need to get department managers to agree to pick one product as a standard so they can create a usable groupware environment.

"Otherwise, people build applications that conflict with one another," Beckman said.

Ultimately, Beckman said he hopes that widespread support for the Distributed Computing Environment from the Open Software Foundation will resolve many of these conflicts.

Briefs

IBM manufacturing tools
IBM has tapped AGS Information Services, Inc. to market and support its CIMAPPS software, which was designed to streamline manufacturing business processes under IBM's AIX and OS/2.

Meanwhile, IBM plans to resell Unix-based client/server manufacturing programs from Tivoli, Inc. Arix-based Avalon Software, Inc. RISC System/6000 users will be able to buy Avalon CIM, a 12-piece line of integrated manufacturing and financial applications, from IBM, the companies said. Along with Oracle Corp., Avalon is one of few vendors to offer client/server manufacturing products.

Client/server labs
IBM has opened the first two of its integration laboratories to test client/server products and services. The labs are in Research Triangle Park, N.C., and Austin, Texas.

Resume package
SAP AG plans to integrate a resume-processing package from Resumatix, Inc. in San Mateo, Calif. into its client/server human resources product line, according to a Resumatix spokeswoman. Resumatix uses artificial intelligence to match job applicants' resumes with skills listed in job postings.

SQL-to-TCP/IP networks
The SQL Access Group released its first specification for connecting SQL software to Transmission Control Protocol/Internet Protocol networks. The Remote Database Access document provides for software vendors a definition for communications between clients and remote database servers.

Silicon Graphics, Inc. has introduced InPerson, desktop conferencing software designed for interactive collaborative work on the company's workstations, including the new Indy desktop system.

InPerson allows users to share high-quality audio, video, images, text and three-dimensional models in real time over standard network connections.

The software employs a media user interface called Indigo Magic, and it is fully equipped with multiway conferencing and messaging indicators. The product works over standard Unix networking protocols.

InPerson software will be available for the Indy and Indigo desktop systems in December 1993 and for other Silicon Graphics workstations by the end of 1994, the company said.

A single-user license will cost $495.

▶ Silicon Graphics
2011 N. Shoreline Blvd.
Mountain View, Calif. 94039
(415) 960-1980

Vycor Corp. has announced Release 1.1 of DP Umbrella for Windows SQL, a high desk product that manages an integrated database for clients, personnel, systems, components, connections, activities and tasks.

According to the company, the product is intuitive and efficient because it uses pull-down menus, scroll bars, buttons, prioritizing and alarm features and automatic transaction updates.

Other new features include unlimited user-defined field labels, in-sort pop-up lists to specifications, a Lotus Development Corp. CC:Mail interface for receiving calls and sending tasks and messages, on-line Help and a tutorial.

A five-user network version of DP Umbrella for Windows SQL costs $6,995. A site license costs $21,995.

▶ Vycor
M/S 304
5411 Berwyn Road
College Park, Md. 20740
(301) 220-4450

US LAN Systems Corp. has chosen Microsoft Corp.'s Access as the platform for Version 3.0 of USL Financials and SQL Fund Master, its client/server accounting software.

An enhanced graphical user interface for all data entry screens is included in this version, and all hard copy and screen reports will be done in Microsoft Access, the company said.

Eight accounting modules are currently shipping based on Microsoft's SQL Server/Sybase.

The modules include Accounts Payable, Accounts Receivable, General Ledger, Job Cost, Inventory, Purchase Order, Check Reconciliation and Payroll. Access screens will replace the current Windows interface.

All eight modules of USL Client/Server Financials 3.0 are scheduled to be available at the end of the fourth quarter, according to the company.

Prices range from $3,500 to $76,000.

▶ US LAN Systems
6237 Old Courthouse Road
Vienna, Va. 22182
(703) 790-2754

Artecon has introduced FileTrek, a client/server network-based distributed Hierarchical Storage Management (HSM) System for Sun Microsystems, Inc.'s Scalable Processor Architecture and Hewlett-Packard Co.'s HP 9000 platforms.

According to the company, FileTrek provides a complete suite of HSM capabilities such as automatic restoration, archiving, system backup and user-transparent file migration for the heterogeneous computer environment.

Based on user-defined criteria, targeted files can be moved automatically and transparently to less expensive storage.

The product adheres to industry-accepted standards, including ISO 13346 nonsequential recording format, IEEE Mass Storage Reference Model and the Open Software Foundation's Distributed Computing Environment and OSF/Motif.

Pricing begins at $7,500 and includes a server license for up to 16 cartridges and client license for unlimited workstations (same platform) in the network.

▶ Artecon
2460 Impala Drive
Carlsbad, Calif. 92008
(619) 931-5500

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SERVICES
NET MANAGEMENT

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Enterprise Networking

Novell services win kudos

By Elisabeth Horwitt

PROVO, UTAH

Novell, Inc. seems to be winning some praise, at the expense of Microsoft Corp., for its strategy to provide all the key pieces that corporations need for their networked enterprise computing plans. Users and analysts cited two key areas where Novell seems to have successfully differentiated itself from its rival.

One point of differentiation is Novell's willingness to share the glory with its partners. "Microsoft is trying to do it all: desktop, network and applications," said Robin McColskin, a network planning analyst at National Grocers, Inc. "Novell is letting third parties handle some of it."

Another reason for Novell's success is its strength in the area of server technology. Novell is positioning NetWare to deliver key services without users having to fit clients with extra hardware and software. And the vendor is also using NetWare 4.0 as the keystone of an integrated set of enterprise services, such as authentication, directory, network and systems management, Novell spokesmen said at a recent briefing.

Both these strategies are coming into play as Novell rolls out a series of NetWare Application Services that were designed to position its network operating system to deliver services traditionally outside its bailiwick. These include video, telephony and imaging applications.

Smart buy

For example, Novell's recent acquisition, Fluent, Inc. in Natick, Mass., has come up with a product that is said to enable a NetWare server to deliver full-motion audiovisual material over a local-area network to any Windows client. Novell is also working with AT&T to develop a NetWare Loadable Module that will enable Net-

Ware servers to participate with private branch exchange systems for applications such as customer service and intelligent dialing.

"Novell's vision is precisely on target" in that it makes such resources available to clients without the need to install a special video board or software on each one, said David Strom, president of David Strom, Inc., a Port Washington, N.Y., consultancy. In contrast, "Microsoft is a very client-centric company that thinks everyone will upgrade their clients to handle fancy things like multimedia and video."

Novell's Application Services will be one layer of a model that the firm has developed for implementing NetWare as a distributed system whose services are accessible and manageable across the enterprise, a Novell spokesman said.

At the center of the model is the NetWare operating system and services such as database and authentication. Application Services runs on top of these items.

And wrapped around the application layer will be the NetWare Directory Service, which will allow client applications to transparently access any service on any server in the enterprise, Novell spokesmen said (see chart). In the works are management services that will ensure such services run reliably and can be updated from central locations. These services will eventually run across NetWare and UnixWare, the Unix environment provided by Novell subsidiary Unix Systems Group, company spokesmen said.

Government ties to Internet expand citizens' access to data

By Gary H. Anthes

WASHINGTON, D.C.

One Wednesday afternoon last March, the White House called the Extension Service of the U.S. Department of Agriculture and posed this question: "What could a national youth service program, as administered by the Extension Service, accomplish for America?" Reply by Friday morning, please.

Not everything in government moves slowly. By Thursday evening, ideas were coming in from agriculture extension agents around the country, and by the White House deadline, 1,000 electronic responses had been received, thanks to a recent move to put agents on the Internet.

Long used by researchers at the U.S. departments of Defense and Energy, NASA, the National Science Foundation and a few other bastions of science and engineering, the Internet is now welcoming the likes of agriculture extension agents, economists, lawyers and other nontechnical government officials up to and including President Bill Clinton.

The surge in Internet use by nontechnical government users parallels a similar trend in the corporate world, where financial and administrative personnel are using the network for electronic mail and database access.

And, as the Internet increasingly becomes a tool of bureaucrats, so is it also becoming a means for the public to download government data, find answers to questions and communicate with public officials. Increased use of the Internet by the government—and by the citizens it serves—is a major component of Clinton's technology vision for the country.

Internet connections have recently been made at the following agencies:

• The Department of Commerce said last month it would make its major databases of financial information from the Department of Labor, the Federal Reserve System, the Department of the Treasury and the Bureau of the Census available via the Internet.

"We've had this data available on a simple dial-up basis for about eight years," said Jack Kremenaw, director of the Office of Business Analysis at Com-

merce. "We are just trying to keep up with the times."

• Also last month, the U.S. General Services Administration began offering Internet access to its "Catalog of Federal Domestic Assistance," which contains information about 1,308 federal programs including grants, loans, loan guarantees, scholarships, insurance

and so forth.

• In June, President Clinton and Vice President Al Gore put electronic mail boxes on the Internet.

• In April, the Library of Congress put its 28 million-record card catalog on-line via the Internet.

"Investment in a national information

infrastructure is one of the initiatives that is being pursued to build America's economic strength through technology," wrote Reed Phillips, the Commerce Department's director for Information Resources Management (IRM), in a recent memo to senior IRM managers at the agency. "In the short run, this initiative expanded access to Internet and in the long run, development of the National Research and Education Network."

Among the replies to Reed's memo, which noted managers "to consider expanded use of the Internet," was one from the U.S. Patent and Trademark Office telling of its plans for giving the public Internet access to huge databases of patent information.

Not all agencies have enthusiastically embraced the medium of all networks, however. Corporations, public interest groups and members of Congress have pressured the U.S. Securities and Exchange Commission to make the data in its electronic filing system available to the public over the Internet. So far the SEC has resisted, saying that it already provides access in other ways and that setting up and maintaining the Internet connection would be too expensive.

Bell Labs drives NCR ATM effort

By Thomas Hoffman

NCR Corp. last week threw its hat into the ring of aspiring Asynchronous Transfer Mode (ATM) vendors. The company's ATM products will focus on optimizing local- and wide-area network bandwidth for data, video and voice transmissions at speeds reaching 3.2G byte/sec.

By announcing its strategic ATM directions, the Dayton, Ohio, computer firm joins IBM and a cast of smaller networking-specific players in the race to cash in on the crowded but relatively small ATM market. NCR will rely in great part on AT&T Bell Laboratories' communications expertise.

Analysts said they were impressed with NCR's plans to deliver its Universal array of workgroup, departmental and backbone ATM premises switches based on a common scalable ATM chip from AT&T called Phoenix.

"If you've got multiple architectures to approach, it's more expensive to maintain compatibility than if you have a single platform. That's a pretty rational approach," said John Rymer, editor of "Distributed Computing Monitor," a monthly report published by the Patricia Seybold Office Computing Group

in Boston.

Unlike other ATM players that plan to deliver their backbone switches first and workgroup switches later, NCR will ship its workgroup switches sometime in mid-1994 and its departmental and backbone ATM switches later in the year. It will target the workgroup switches at branch environments, particularly NCR's cadre of banking and retail customers, according to David Lindmeier, a product manager at NCR's network hardware business unit in Lincroft, N.J.

Lindmeier said pricing for all of NCR's ATM products would be announced closer to rollout.

The workgroup switches, designed to support roughly 20 branch PC users with WAN connections to headquarters, will provide up to 3.08M bits of output bandwidth, the equivalent of two T1 lines. The departmental switches were designed to support larger Ethernet or Token Ring workstation environments, providing up to 1.6G bits of throughput.

Mixed feelings

Analysts offered mixed views on NCR's choice of promoting its workgroup ATM switches first. "They will pay a price for making that choice," Rymer said. "Most of the growth in ATMs is going to be in the

backbone network first, and NCR will be later to market with backbone products."

Still, Rymer praised NCR for placing the workgroup needs of its banking and retail customers ahead of the burgeoning backbone market.

Bankers Trust Co. in New York plans to address its enterprise backbone needs ahead of its workgroup requirements, according to Anish Mathai, vice president of technology/strategic planning for the firm.

"We're looking at the enterprise first, primarily because our biggest communications issues are internal and because our workgroups are dispersed around the world," Mathai said.

Still early

But Bankers Trust, like most prospective users, is in the early stages of evaluating the ATM market. And because he expects a solid offering from AT&T/NCR, Mathai said the firm will likely consider NCR's backbone switch before making a decision.

Before the workgroup, departmental and enterprise switches are rolled out, NCR will ship its SmartHub XE ATM switch next summer. SmartHUB XE is an entry-level, pluggable ATM switching module that permits users to evolve to ATM technology gradually. The SmartHub XE, equipped with an Ethernet-to-ATM bridge, was designed to support up to three LAN segments.

Each four-port ATM switching module will be able to provide up to 800M bit/sec. of aggregate throughput and Simple Network Management Protocol management.

One-stop box

New devices to propel technology into social fabric, report says

By Gary H. Anthes

A new computing architecture, called "social computing," will emerge as new technologies such as handheld computers, intelligent telephones and interactive television begin to collide with unmet needs in American society.

The architecture will move the center of computing gravity outside the walls of business and into society at large, said Cambridge, Mass.-based Forrester Research, Inc. in a recent report. Traditional ways of buying and selling will give way as customers order products and services through electronic media while communicating electronically with other consumers and businesses.

That will bring companies into direct, continuous contact with consumers of their products. Suppliers that fail to embrace this new architecture will be abandoned by "techno-tuned" customers who are increasingly impatient with the frustrations of modern life, Forrester said.

"It will be the increasing ability of ordinary people to communicate electronically with large corporations that really

reshuffles the competitive deck," the report stated.

In the past six months, computer makers, software vendors, cable television operators and telephone companies have engaged in a "frenzied mating dance," Forrester said. The dance appears chaotic, but these streams of innovation will soon converge:

• Within five years a new generation of TVs, telephones and handheld electronic devices, derivatives of PC hardware, will support two-way data communications.

• Wireless and traditional networks will fuse to offer "anywhere, anytime" communications.

• Commercial information services and bulletin boards will explode in number and move into mainstream use.

As digital technology introduces it-

Social computing

The right technologies and business services must come together to enable social computing

Source: Forrester Research, Inc., Cambridge, Mass.

self in a variety of low-cost, portable information devices, that gives another way for vendors to improve or simplify service or lower costs," said Carl Lehmann, director of consumer media and electronics at BIS Strategic Decisions in Norwell, Mass. "The market is driven by,

'Make my job easier, make me smarter faster and make me have more fun in the limited time that I have.'"

But Lehmann predicted that a mass market—defined by the U.S. government as regular use in 30% or more of U.S. homes—for the components of "social computing" is at least a decade away.

Forrester said a move down the road to client/server can help companies prepare for social computing by giving them practice dealing with common issues such as the "democratization" of data. Client/server also offers exposure to technologies such as groupware, server databases, electronic mail and mobile networking, all of which are likely to become important components of social computing, Forrester said.

Small player offers net management

By Elisabeth Horwitt
BAR-LUIS OBISPO, CALIF.

A small vendor claims to have come up with a set of network and network server management applications that provide a level of integration and functionality that compares favorably with offerings from the big guys.

XTree Co. announced NetControl, a set of application modules that are said to manage a full range of network devices and systems via the Simple Network Management Protocol (SNMP). Different modules provide the following:

- Real-time monitoring of local-area network devices, using the SNMP Remote Network Monitoring standard.
- Auto discovery, which seeks out network systems and automatically displays them on a map.
- Management of network servers, including Novell, Inc.'s NetWare 2.x and 3.x, Banyan Systems, Inc.'s Vines and Microsoft Corp.'s LAN Manager.

The applications for managing NetWare, which Xtree has been offering since 1988, are said to provide more in-depth analysis than Novell does for its own servers. For example, the Xtree tools are said to perform 100 tests on 3.x servers and to monitor Transmission Control Protocol/Internet Protocol devices in a more integrated way than Novell does through its Lantern diagnostic tool. An application to manage NetWare 4.0 is planned for 1994.

Also included is a database for historical reporting based on Novell's Btrieve

and a trouble-ticketing application.

A graphical user interface, running on a Windows console, provides users with a consistent environment for calling up applications and displaying information and alerts, an Xtree spokesman said.

The company is seeking support from third-party network vendors. 3Com Corp. has agreed to make its equipment

manageable by NetControl.

XTree is also holding discussions with systems integrators to provide the implementation and ongoing support that corporate users demand for an enterprise network management system, the Xtree spokesman said.

NetControl will support the Internet Engineering Task Force's Host manage-

ment information base for managing servers and the Desktop Management Task Force's standard for collecting information about client systems' software and hardware components.

NetControl Console Module, Server Modules and Device Modules will begin shipping in November.

The console is priced at $895 per station and the server modules at $995 per managed server. The device modules are priced at $495 per managed device.

Switching hub links FDDI to Ethernet

Network Peripherals recently announced a Fiber Distributed Data Interface (FDDI)-to-Ethernet switching hub.

The hub is meant to connect to 100M bit/sec. FDDI server networks with 10M bit/sec. Ethernets. Unlike traditional Ethernet switching hubs, it allows traffic from servers on the FDDI ring to deliver data to the Ethernets at 100M bit/sec.

Currently, some companies use routers between high-speed server networks and Ethernet local-area networks. The switching hub, however, is a less expensive connector because it switches traffic using hardware only at the media access layer and is protocol-independent. This also means it is not programmable like a router, and the hub is not meant to replace a router on wide-area networks, said Gordon Stitt, vice president at Network Peripherals.

The hub can scale up to 68 Ethernet segments and includes Simple Network Management Protocol management. Future network support will include Asynchronous Transfer Mode. It is priced at $7,500 for 12 dedicated Ethernet segments and $576 per FDDI port. It will be available in October.

— Lynda Radosevich

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Fax server delivers data around globe

By Jean S. Bozman
PALO ALTO, CALIF.

Dialog Information Services, Inc. has a new way to deliver data from the 450 databases stored on its IBM VM/CMS mainframes — a Unix-based fax server.

The new delivery system, expected online by 1994, will not replace traditional dial-up and electronic-mail access to Dialog. Instead, it will lead to further re-engineering of Dialog's 20-year-old mainframe applications, information systems executives were told.

A local-area network of Sun Microsystems, Inc. SPARCstation 10 workstations will host a series of Unix-based applications written in C language, said Wayne Martin, director of operations at Dialog's data center. The workstations know how to navigate through Dialog's homegrown database structure — and through some 2 terabytes of stored mainframe data. An alpha test of the new Unix system is set to start this month, Martin said.

The addition of Unix systems is being made to improve client/server access to the Knight-Ridder, Inc. subsidiary's central data center. It is also moving to support more open systems standards, such as Transmission Control Protocol/Internet Protocol and the CCITT's X.400 E-mail standard. Dialog's base of more than 150,000 users worldwide employs a hodgepodge of IBM 3270 terminals and PCs to access central databases through low-level teletypewriter and Teletype emulation. Dialog also distributes some of its databases on CD-ROM.

"It's somewhat easier to deliver fax from an open environment than from a mainframe environment," said Gordon Schick, vice president of systems and operations. "Clearly, there are going to be plans to change to an open environment." Development of more Unix applications is already under way, but any substitution of back-end Unix parallel servers for the firm's IBM-compatible mainframes would be several years away, he said.

By directing new application development projects to the Unix platform, Dialog planners hope to create new services more quickly and save money, too. "It's more cost-efficient to develop on new platforms," Martin said. A small group of 10 programmers wrote the new fax server system in a matter of months, for example. However, Dialog also faces the task of migrating to Solaris 2.X from the older SunOS operating system, he said.

The Sun workstations, located just outside the data center, will act as data lenses and gateways for the new fax service. "The [Dialog] customer still connects through the mainframe," Schick explained. "But the server will be the one [device] responsible for routing the data and tracking it."

So far, Dialog's mainframes still beat workstations for sheer throughput, Martin said. For the immediate future, the mainframe will continue to act as both a front end to all databases and as a database server. "What these mainframes do, they do very, very well," he said. "They push large amounts of data in a short period of time." They also have features that ensure reliability and availability, which are only now being added to Unix.

But by bringing in new technology Dialog may avoid an architectural dead end.

Since its founding in the early 1970s, Dialog has built its query engines on IBM mainframes, complete with their high-operating costs. Unix-based instruction set computing-based systems and C is less costly and offers a way to migrate to new hardware platforms, such as massively parallel servers, Schick said.

Dialog announced plans to form partnerships with several outside firms to bring about a move to updated systems by the late 1990s.

How to keep a mixed from becoming a mixed-

NETWORK ARCHITECTURE

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> "It takes network printing one step beyond what any supplier has done so far."
> — Bill Gott, InfoCorp, as quoted in InfoWorld

Briefs

Fast Ethernet

Grand Junction Networks, Inc. in Union City, Calif., unveiled a new family of Ethernet products for workgroups. The FastLink product family is composed of FastSwitch 10/100, which provides 100M bit/sec. Ethernet to servers and 10M bit/sec. Ethernet to clients; FastNIC 100 EISA, the first 100M bit/sec. Ethernet

adapter; and FastSwitch 10, a low-cost 10M bit/sec. Ethernet hub with 24 ports. The FastSwitch 10/100 will be available in the fourth quarter for $7,250. The FastNIC card will be ready in the fourth quarter for $350 and will include Novell, Inc. NetWare drivers. The FastSwitch 10 will be available in September for $6,250.

Join together

3Com Corp. and Novell announced a partnership to deliver tighter integra-

tion between 3Com's routers and Novell's NetWare operating system. In related news, 3Com announced support for Novell's IPX WAN, a multivendor router protocol, and Novell's NetWare Link State Protocol.

Marketing partner

NCR Corp. announced an agreement with Anixter Brothers, Inc., a reseller of intelligent hubs, to market NCR's StarLAN and WaveLAN products.

NCR also added Novell NetWare enhancements to its StarGroup family of networking software for its NCR System 3000 platform.

PC parts

Legend Corp. in Herndon, Va., and Atlanta-based Digital Communications Associates, Inc. announced an agreement under which Digital Communications will resell the PC components in Legent's XCom file-transfer product for Windows and OS/2.

LAN agreement

Windata, Inc. and Gandalf Technologies, Inc. have announced they will begin to incorporate Windata's FreePort Wireless Ethernet LAN system and Gandalf's LANline 5220 Remote Ethernet Bridge.

Two views

Synernetics, Inc. has added support for Hewlett-Packard Co.'s OpenView to its Viewplex product for managing Synernetics hubs. Viewplex also runs on Sun Microsystems, Inc.'s SunNet Manager.

Good idea

Ideassociates, Inc. in Billerica, Mass., has signed up Ingram Micro in Santa Ana, Calif., to distribute the Idea family of internetworking products, including the Ideacom Brouter, Ideacom WAN-server and Ideahub.

Double switch

Hub supplier Optical Data Systems, Inc. in Dallas and Ariel Communications Corp. in Hudson, Mass., have agreed to integrate the Ariel StarBridge Turbo Ethernet Switch into Optical Data's Infinity Intelligent Switching hub. The StarBridge technology will be used in the 6-, 7- and 12-slot Infinity hubs.

Video proliferation

UK-based BT and VideoLogic in Cambridge, Mass., have announced a cooperative agreement under which they will develop PC-based video conversion products. VideoLogic will market BT's PC videophone, and the companies will work together to market combinations of their products for targeted customer applications. VideoLogic's products include the DVA-4000 digital video adapter; Mediator, a computer graphics-to-video conversion system; a digital video and audio compression system; high-performance graphics processors; and a movie capture card for Microsoft Corp.'s Video for Windows.

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OPERATING ENVIRONMENTS

Novell NetWare, Apple EtherTalk, Apple A-UX, VAX/VMS, ULTRIX, MicroRVX, DECNET DOS, SunOS, HP-UX, IBM AIX, AT&T System V, Interactive Unix System, SCO Unix, Tandem NonStop-UX, IQ, System V, Bull B.O.S. Unix, Data General Apex, Unisys System V, Berkeley UNIX, Tadpole TPIX, Wollongong WIN-TCP

(Support for Microsoft LAN Manager, Windows NT, and IBM Token Ring coming soon.)

Dataproducts

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Dataproducts Corporation. All rights reserved. PostScript and Adobe are registered trademarks of Adobe Systems Inc. The named network operating environments at the above table are all trademarks of their respective owners.

Crescendo Communications, Inc. has introduced an Sbus dual-attach adapter, based on Crescendo's Copper Distributed Data Interface (CDDI) architecture.

The CDDI Sbus dual-attach adapter provides dual-attached network connections for fault tolerance, a Simple Network Management Protocol (SNMP) agent for remote monitoring and control

and an on-board processor to reduce host overhead.

According to the company, a dual-attach Fiber Distributed Data Interface (FDDI) Sbus adapter for fiber-optic cable that presents the same feature set was also introduced.

An on-board processor that performs station management functions is used by both adapters, and the FDDI adapters are the only 100M bit/sec. Sbus solutions that include an SNMP agent for remote

network management.

The CDDI Sbus dual-attach adapter costs $1,995, and the FDDI Sbus dual-attach adapter costs $2,995.

▶ *Crescendo Communications*
710 Lakeway Drive
Sunnyvale, Calif. 94086
(408) 732-4400

Spider Software, a division of Spider Systems Ltd., has announced Spider-Frame-Relay, a portable, Streams-based

product that gives computer and communications equipment suppliers the ability to add frame-relay functionality to their products.

According to the firm, manufacturers and systems integrators that want to provide frame-relay access for devices, including bridges, routers, hubs, communications boards and communications servers, can do so by using the frame-relay technology under source-code license from Spider Software.

Support is provided for Permanent Virtual Circuits and Switched Virtual Circuits, and the software protocol stack is compatible with ANSI and CCITT recommendations for the Frame Relaying Bearer Service.

The product comes with an application programming interface and has a local management interface for access and control of layered information.

The product will be available during the first-quarter 1994.

A source-code license will cost $30,000.
▶ *Spider Software*
Suite 570
33 Boston Post Road West
Marlboro, Mass. 01752
(508) 460-0049

Product shorts

Beall Technologies, Inc. has started delivering its Beall Link 5000 Escon products. According to the company, the family of products provides IBM Escon channel extension to 20 km and offers conversion capabilities for Escon fiber exchange channels to bus and tag control units as a stand-alone function or in conjunction with a channel switch. Cost ranges from $10,000 to $200,000. Beall Technologies, Secaucus, N.J., (201) 864-9433... **Moses Computers** has introduced MosesSpool, a printer sharing system designed to let users upgrade to a local-area network. All the necessary hardware, software and cabling to connect two PCs for printer sharing purposes is included. MosesSpool will begin shipping in September. Cost: $179 per two-node starter kit. Moses, Los Gatos, Calif., (408) 356-1550.... **Digital Communications Associates, Inc.** has announced Version 3.1 of the IRMA Workstation for Macintosh. The product is Macintosh-to-mainframe software that includes TN3270, an implementation of the standard Telnet protocol for accessing IBM mainframes over Transmission Control Protocol/Internet Protocol networks. Cost: $425. Digital Communications Associates, Alpharetta, Ga., (404) 442-4000.... **CR Systems Corp.** has released Multi Protocol SNA Xpander, a converter that allows for the migration of Systems Network Architecture (SNA) lines and mixed Ethernet LAN and/or Token Ring environments to a Logical Link Control (LLC)-based internetwork. The Multi Protocol SNA Xpander makes it possible to support SNA host access through LLC from any mix of Synchronous Data Link Control lines and PCs with 3270 emulators. Cost: ranges from $17,950 to $28,750 for up to two LANs serving 32 communication lines. CR Systems, Atlanta, Ga., (404) 767-9290.

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Large Systems

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Parallel processing

Union Pacific rail says, 'I know I can'

By Thomas Hoffman
OMAHA

Transportation companies have been among the pioneers when it comes to adopting massively parallel processing systems to power their decision-support systems, analysts said, and Union Pacific Railroad is no exception.

Since the first quarter of 1992, the rail division of Union Pacific Corp. has been re-engineering decision support by moving data from its IBM MVS mainframe legacy systems to an NCR Corp./Teradata Corp. DBC/1012 massively parallel database engine, according to Joyce Wrenn, vice president and chief information officer at the railroad. The project was launched so users could more easily manipulate and analyze information on train schedules, customer locations, fuel costs and capital deployment using distributed Unix-based PCs instead of IBM 3270 terminals.

More recently, Union Pacific decided to invest in an NCR

Union Pacific, *page 93*

Union Pacific Railroad hopes to give users new decision-making powers

Warehouses cling to mainframe

Client/server systems slow to crack data warehouse market

By Johanna Ambrosio

● While some users are loath to rely entirely on a client/server architecture for their data warehouses, others are moving ahead without the benefit of a mainframe.

Playtex Apparel in Dover, Del., for example, is phasing out its leased IBM host and has put its warehouse on a Unix computer. But not everyone has that luxury — at least not yet.

"I haven't seen anything mainframe-strength enough to take hundreds of users' pounding and still remain standing," said Mark Theissen, a customer segment leader in data management at Hughes Electronics in Fullerton, Calif. The company's 50G-byte warehouse, which contains financial data, resides on a mainframe with Unix servers that provide end-user access.

At Florida Power & Light Co. in Miami, "It's primarily a manpower issue," said Jonathan Geiger, data management supervisor. "We aren't even using the mainframe warehouse to its fullest capacity."

Most warehouse implementations already make some use of client/server architecture; indeed, in many companies, the warehouse is the first real test of their client/server components. But in virtually all of these early warehouse adopters there is also a mainframe, which form most of the data resides and to which servers and PCs are attached.

Warehouses that are completely off the mainframe are still relatively rare. Since it announced its specialized database management system for warehouse applications in September 1992, Red Brick Systems has sold 20 copies, said Chris Erickson, president of the Los Gatos, Calif., company.

Typically, he said, the warehouse applications built with his company's product are used at companies that are downsizing or that have chosen to separate the warehouse into pieces by product line or by business unit. "We see very little interest in having the financial database in one location, marketing in another, inventory in another and so on," Erickson said.

Downsizing success

Playtex Apparel is a classic example. The company is downsizing all its applications off a leased mainframe. The data warehouse contains product, distribution and shipment information used by the sales and marketing forces. Although only five users are up and running thus far, about 20 more are slated to use the system by the end of October.

The warehouse, running Red Brick's database on a Hewlett-Packard Co. HP 9000 computer, has not yet been fully stress-tested, said Sandra Tucker, Playtex Apparel's MIS supervisor. "We haven't gotten deep enough into the user community to see if performance will degrade" when everyone's using it at the same time, she said. Then, too, only about half the data has been loaded at this point, with two years of history expected to be on-line eventually.

Still, even at this point Tucker said she considers the warehouse a success. Custom reports that used to take two weeks to order, run and test from the information systems department now run in minutes on the system. Sales and marketing can figure out what products are selling and where, and what promotions seem to be most effective.

Then, too, the idea of client/server warehouses seems to be picking up steam, albeit slowly. Bill Inmon, a consultant associated with software vendor Prism Solutions, Inc. in Sunnyvale, Calif., said he has been noticing more and more non-mainframe warehouse implementations.

It may be a long time, however, before current mainframe warehouse users are ready to switch over. "Corporate infrastructures are a lot further behind than many people think," Theissen said.

Briefs

Cornell to buy IBM system

The Cornell Theory Center at Cornell University announced plans to purchase one of IBM's SP-1 Scalable Power parallel supercomputer systems for $13 million, primarily through funding from the U.S. Department of Defense's Defense Advanced Research Projects Agency and the National Science Foundation.

The 512-processor system, based on IBM's RISC System/6000 chip design, will be installed in the second and third quarters of 1994. The supercomputer will be used to tackle high-performance scientific applications such as fluid dynamics and seismic analysis, though small-to medium-size commercial businesses would be able to buy time on the machine for $10 per processor hour, according to Malvin Kalos, director of the Cornell Theory Center.

EMC seals Bell Sygma deal

EMC Corp. in Hopkinton, Mass., announced the sale of $4 million in Symmetrix 5500 Integrated Cache Disk Array mainframe storage systems to Bell Sygma, a Bell Canada subsidiary with operations in Toronto and Montreal. Continuing its parent's pattern of robust growth, EMC's Canadian operation has brought in more than $20 million in revenue this year, more than doubling last year's figures.

Cray wins computer contract

The National Oceanic and Atmospheric Administration (NOAA) awarded a five-year, $46 million contract to lease a 16-processor C-90 supercomputer from Cray Research, Inc. The computer, which the NOAA said will operate at 15 billion operations per second, will be used by the National Weather Service to generate its daily midrange forecast.

Softwrks, Amdahl team up

Softwrks, a vendor of systems management software, has agreed to jointly develop training materials with Amdahl Corp.'s education and training division. The courses will focus on maintenance of and disaster recovery techniques for ICF and VSAM catalogs.

Multimedia training

In other training news, Databhox, Inc. in Northridge, Calif., announced Version 3.1 of TrainEase, its multimedia tool for developing presentations on the Application System/400 and mainframes. TrainEase runs on PCs, but it captures keystrokes and data from the larger machines; it also supports full video.

Bell wins Lockheed contract

Lockheed Information Technology Corp. has awarded a five-year multi-million-dollar contract to Bell Atlantic Business Systems Services for service of its Denver data center and some other sites. Bell Atlantic will support three IBM 3090 000J mainframes, as well as Digital Equipment Corp. minicomputers and Storage Technology Corp. tape silos.

NCR trade-in

NCR Corp. has introduced a program for customers of its older midrange systems to receive trade-in credit toward its NCR System 3000 machines.

Separately, NCR has dismissed its lawsuit against First Financial Management Corp. (FFMC) regarding a signature capture device developed by FFMC subsidiary MicroBilt Corp. As a result of the settlement, the companies entered into a joint marketing and delivery agreement for the systems.

SHORT TAKES Unisys Corp. announced that its FBA Navigator retail banking system will support Microsoft Corp.'s Windows NT operating system. . . . The ASK Group, Inc. moved Eric Carlson from president of the manufacturing applications unit to the new position of head of corporate strategies and new ventures. Amal Johnson, an 18-year IBM veteran, is slated to take over Carlson's former post. . . . IBM has announced the general availability of CICS/6000, the version of CICS that runs under IBM's AIX operating system. . . . According to the SQL Access Group, its Remote Database Access specification for the OSI model is now final and available from the Manchester, N.H.-based organization for $62. . . . SAS Institute, Inc. has signed an agreement for IBM to market its SAS System product line to VSE customers.

Clean up

Network management can go many —especially when you have multiple environments. Fortunately, the people who helped you build your network have a cleaner way to manage it all.

SynOptics is a natural choice for network management. We not only pioneered the intelligent hub, but we were the first to provide integrated SNMP management in Ethernet, Token Ring and FDDI networks. As a result, we've become the hub of network management for over six million users worldwide.

With SynOptics, your whole approach to network management is cleaner. Our Optivity™ and LattisWare™ software solutions support all major network technologies, as well as emerging ones like ATM. Be a SNA™, NetWare™, TCP/IP, or a mix of all three, our customized solutions handle it all. For example, we've integrated Optivity and LattisWare

Union Pacific

3600 massively parallel system that will hold the Teradata database. The $6 million system, which includes several multiprocessing servers, was purchased by Union Pacific Technoloties, a St. Louis-based services firm that supports the operations of Union Pacific Corp., compa-

nies such as the railroad and Skyway Freight Systems, Inc. The railroad will be the first of the corporate entities to utilize the NCR 3600 system.

Union Pacific is remodeling data now housed in IBM DB2 databases for access through the Teradata system. Wrenn said the firm's end users running client/server applications will be better equipped to access and query data for decision support.

"We expect that most of our depart-

ments will get a big benefit from being able to query data that's already out there but difficult to retrieve from the mainframe," Wrenn said.

The move reflects a growing trend among transportation companies to tap massively parallel systems for decision-support analysis, according to David Frankel, director of technology at Smaby Group, Inc., a Minneapolis-based market research firm that specializes in high-performance computing. "Transporta-

tion companies are optimizing their decision-support systems with large databases in growing numbers," said Frankel, who noted Delta Air Lines' use of a Teradata DBC/1012 database for freight tracking and decision support.

To extract and remodel data from the legacy systems for parallel processing on the Unix-based machine, Union Pacific is using Texas Instruments, Inc.'s Information Engineering Facility computer-aided software design suite, said Mark Davis, director of data management at the railroad. He said once the data has been developed and tested on the Teradata machine, it will be loaded onto the NCR 3600 for production. The NCR 3600 is slated to be in full operation by early next month. Until then, the Teradata machine will handle existing production applications.

Currently, 460 bytes of data resides on the Teradata system. The railroad plans to add 1000 bytes of data to the NCR 3600 each year, Davis said. In the past, that data would have been stored on the mainframe.

As a result, Davis said he believes the railroad's use of Information Builders, Inc.'s Focus for TSO, a fourth-generation language Union Pacific has used to access mainframe data, will decline as users gain access to data from their PCs.
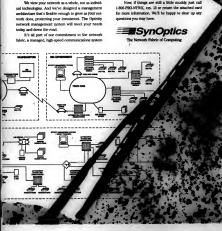
In addition, the railroad is developing new applications to run on new systems. They include client/server systems running on an NCR 3550 midrange server that will be used to power the company's new revenue management and railroad yard systems. The revenue management system, in development since last fall, and the railroad yard system, in development since April, are slated to go into operation next year, Davis said.

He said the railroad will likely begin to port some of its legacy data to the client/server architecture in mid-1994. The legacy systems will remain on the mainframes for a while, but as the railroad develops client/server applications, the legacy systems will fall by the wayside.

Catch a r

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Lessors change tactics with the times

Industry's top firms say close relationships with suppliers key in sluggish market

By Ellis Booker
CHICAGO

Leasing companies are scrambling to keep up with a changing industry by handling more low-end equipment and providing asset management services, among other moves.

"Many of us have gotten into the oversight workstation business," said Thomas C. Wajnert, chairman and chief executive officer of AT&T Capital Corp. in Morristown, N.J., which claims a portfolio of just 34 large mainframes, half of which are leased to AT&T. A $6 billion asset entity, AT&T Capital went public last month.

Four top executives from leasing firms talked about these and other trends at a recent Chicago forum sponsored by the Equipment Leasing Association of America in Arlington, Va. Also in attendance were executives from GE Capital Commercial Equipment Financing in Stamford, Conn.; Comdisco, Inc. in Rosemont, Ill.; and Bell Atlantic TriCon Leasing Corp. in Parsipa, N.J.

Computing "costs are going down by 30% to 35% a year," said Kenneth Pontikes, Comdisco president and chairman. "Customers don't want to bring in a system that will last three to five years." Leasing companies, he said, can become "just-in-time suppliers of computer capacity."

While leasing companies continue to have enormous investments — 32% of the $375 bil-

lion U.S. companies spent on equipment last year was leased — returns have been trivially flat, hurt by the sluggish overall economy. At the same time, computer-related goods have become the dominant sector of the market, capturing approximately 23% of the leasing industry's dollar volume in 1992, an increase of 2% over 1991, according to the Equipment Leasing Association's 1992 survey.

Boost in customer support

All the executives agreed that the pace of technological change and the cost profile of distributing computing has forced leasing firms to offer customers more than the mere "financial transactions" that characterized the industry for decades. To survive, if not prosper, all are now offering sophisticated plans and services, including asset management and the short-term provision of computers for peak needs.

"These short-term leases can be extraordinarily profitable," said Timothy Summers, a vice president in the research division at Hamilton Investments, a Chicago-based investment firm. He noted that an Intel Corp. i486-class laptop leased for $40 per day will pay for itself in a month. He said the future growth in the industry will be with companies that focus on the low end and enter into tight relationships with their suppliers.

This is certainly the case at Leasing Solutions, Inc. (LSI) in San Jose, Calif., which to date has eight such vendor ties. The most recent is

with Apple Computer, Inc., which in June made LSI the exclusive source for lease financing for Apple corporate accounts in the U.S.

While LSI is arguably not a low-end provider — its average lease is in the $250,000 to $300,000 range, and its portfolio of 100,000 assets has a value of $350 million — the company "did make a strategic choice when we were founded in 1986 not to be involved with mainframes," said manager of investor relations Timothy P. Leehy.

Mainframe margins

Then again, "There's nothing new about high-technology assets plunging in value," said Pontikes, who founded Comdisco in 1969. Allowing that "nobody is being real aggressive" about residual value assumptions and realizing big margins for mainframes, Pontikes and other leasing executives at the Chicago briefing suggested that the imminent death of the mainframe has been overplayed.

Still, data center products, the category Comdisco was founded on, have shrunk to about one-third of the company's business, Pontikes said. Comdisco has $2.2 billion in revenue and $5.3 billion in total assets.

Summers pointed to Comdisco, which along with IBM Credit Corp., IBM's leasing arm, is the industry's leader in the high-technology arena, as one firm that has seen the writing on the wall and is trying to de-emphasize high-ticket, mainframe-based hardware in its portfolio [CW, Jan. 18]. "It seems to be working for them, but it's a slow process," he said.

Kim S. Nash

Group therapy

Let's do some word association. I say "downsizing" and you say what?

Layoffs and budget cuts? 85 over-heads and canned? I thought so — you're normal. But being normal doesn't necessarily help you endure the pain of downsizing, client/server, rightsizing, et al. Hackles go up when people hear the D-word. And not just among the lumps at every firm who wouldn't change their work habits if their desks were on fire.

Big beneath the downsizing "successes" and you'll find IS managers who admit that the very idea of change touched off a wave of doubt or even subterfuge at their firms. Downsizing means big fat change — technological, business and human change. And it hurts.

People wonder, and rightly so, whether

their jobs are slated for the sharp saw. Should I jump ship before I'm pushed? How can I duck the wrenching change they're foisting on me?

You in IS inherit these cultural issues because you're the people dealing with the downsizing project every day, from the top brass on down. You end up having to build end-user and business-side support, yet you've never before had to deal with these kinds of cultural issues on such a large scale.

Let's face it: IS managers can be ill-equipped to play psychologist and motivator to an entire company. The upshot is that getting users to buy in on downsizing projects isn't easy.

But you're not helpless.

First off, I have yet to find a consultant or IS manager who says you don't need a thumbs-up from the CEO. If the CEO isn't behind the plan, there's probably not much you can do with it. It's that simple.

But, say the CEO is on board. Consultants advise that you should then set up touchy-feely teams of people from lots of different departments. This task force will tell IS what they want out of a new system and revamp/ce the plan to colleagues in theory.

Fly in the ointment

One IS manager recently told the story of a downsizing plan that was methodically undermined by a scared saleswoman in an end-user department. The poor IS guy

was doing everything the fancy consultants say: Coax on board vocal, visible end users. Empower these people by asking for their input. Make them care advocates to IS and management.

But he overlooked the wright sweats. This woman didn't want to lose her spot as the company's top sales rep, and she saw client/server — which gave fellow salespeople more power than they had before — as a threat. So she nodded her head eagerly during team meetings and agreed to herald the downsizing plan to colleagues.

However, when the meetings ended, she zipped her lip and returned to business as usual, leaving fellow workers clueless about coming changes.

"When we came over to work with them, they had no idea what was going on," the IS manager said.

Of course, this tale doesn't address why IS and upper-level managers weren't themselves communicating ideas to the ranks. But that's another column.

The point is that even the appearance of buy-in doesn't mean you have it. Downsizing, moving to client/server, re-engineering — these technological concepts boil down to very political, very human

issues. That's new turf for many IS departments. Although you can't be expected to plow that ground alone, you can do your part to clear paths.

First, know where end users are coming from so you can help them move to the downsized computing airways you and the CEO are hyping. Get outside IS, as one consultant put it.
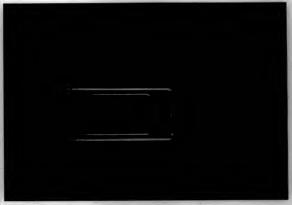
For example, a big finger-lickin' good fast-food chain has started sending IS personnel to work in other departments, including purchasing and finance. These people are not building applications or setting up PCs. They're actually doing the job of purchasers and accountants. Corporate cross-training, if you will.

If that's not possible at your firm, volunteers say at least launch your own public relations campaign. Build a simple prototype of the new system and cart it around the office. Talk to users. Talk to managers. Ask for their input. And — get this — actually incorporate their ideas.

As a consultant friend told me, "The political environment is difficult in downsizing ... It can't hurt to show people what you want to do." Remember Ross Perot's charts and pointer? Never mind that he didn't win the election. He did change the political landscape, which is what you need to do. It's also the toughest part of any downsizing project.

Nash is Computerworld's West Coast correspondent.

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IBM

Exec looks back on IBM career

By Johanna Ambrosio

Earl Wheeler, the soon-to-be-retired head of IBM's Programming Systems division, has few regrets about his performance as the head of Big Blue's software products group. Still, he does allow that some of the large-scale architectures his group cooked up were not exactly on target.

About frameworks such as AD/Cycle and OfficeVision — intended to integrate many different products for application development and office systems, respectively — Wheeler said, "With 20/20 hindsight, the concept was right, but the execution wasn't.

"With AD/Cycle, we had the repository on the wrong platform, and we're fixing that," Wheeler said.

IBM has not yet announced when the revamped repository, slated originally for the mainframe and now to run on a local-area network, will be available. Wheeler said it will be "sometime next year before all the pieces are integrated the way we want them."

OfficeVision "will run very well before this year is over," Wheeler said.

He maintained that Information Warehouse — for customers to build decision-support databases and the last of the IBM grand initiatives to be unveiled — is "working very well."

Wheeler made his comments during a telephone interview after IBM announced his decision to retire effective Aug. 31 [CW, Aug. 16]. He said he and his wife will head to Hilton Head, S.C., to play golf, tennis and, in general, "give my family more time. My kids even gave me some Rollerblades."

Under his management, Programming Systems' revenue grew from $500 million five years ago, when Wheeler started heading up the division, to a projected $3 billion this year. He said the group is profitable but would not provide details.

Wheeler said he is most proud of the "team in place as I leave," and the role he played as the "mentor for all the software development going on at IBM." During the past few years, the division also started developing versions of its software for non-IBM hardware platforms — CICS, for example. That direction will continue, he said.

"There are always things you'd do differently, but as I look back I feel pretty good about the road we've traveled," Wheeler added.

Earl Wheeler: Division's revenue grew to $3 billion

Hardware

System Industries, Inc. has announced its HSI-Series of storage controllers for Digital Equipment Corp.'s VAXcluster systems users.

According to the company, the HSI-44 and the HSI-45 are high-performance Small Computer Systems Interface (SCSI)-based Hierarchical Storage Controller alternatives that are compatible and fully licensed with DEC's Computer Interconnect-based VAXclusters. The HSI-45 also interconnects to DEC's DSSI-based clusters.

The products were designed for users who need open SCSI architecture, high I/O performance and additional connectivity.

Features for the HSI-44 include six SCSI buses that can support seven single-ended SCSI devices in single-host mode and six devices in dual-host mode, the company reported. The HSI-45 supports five single-ended SCSI buses. Two failover/redundant power supplies in a 19-in. standard rack-mount package are included.

Prices begin at $25,500.
▶ *System Industries*
1855 Barber Lane
Milpitas, Calif. 95035
(408) 434-6800

Software

Software Engineering of America has announced Release 4.1 of Keys/MVS for TSO/ISPF and CICS/MVS and Keys/VSE for CICS/VSE, which is for automated help desk management.

According to the company, Keys is a complete on-line system designed for the viewing, organization and archiving of all information concerning data center alterations, conflicts and modifications.

New administrative functions include problem and change management, absolute and date range criteria and the ability to calculate financial information for hardware and software leasing.

New problem history, problem-tracking and batch-reporting capabilities have been added. Audit trailing for all Keys subsystems is provided.

Prices range from $12,500 to $39,200.
▶ Software Engineering of America
1230 Hempstead Tnpk.

Franklin Square, N.Y. 11010
(516) 328-7000

Velocity Software, Inc. has released VM/XA and VM/ESA Monitor Analysis Program (XAMAP).

According to the company, XAMAP is a software tool that produces performance reports from VM monitor data to assist in capacity planning and system tuning.

Shared File System analysis, a Service

Level Agreement facility, rapid install and improved performance are new features, the company said.

Interfaces for Legent Corp.'s MICS, Merrill Consultants' MXG and IBM's SLR are available.

XAMAP can be leased for an annual fee of $3,150 or a onetime fee of $7,500.
▶ Velocity Software
60 Alban St.
Boston, Mass. 02124
(617) 825-3599

NBS Systems, Inc. has announced TOSS/Mainframe Release 3.0, an electronic-mail system for IBM operating environments.

The product, part of NBS Systems Total Office Support System, provides system-related enhancements for efficiency and systems management. It also includes new end-user and administrator facilities.

End-user enhancements include a form-routing facility, multiple time zone support and alternate date display format, a multiple name-picking facility and a revised full-name format, according to the company.

Administrative enhancements include a distributed administrative facility, batch loading of public distribution lists and meeting issue lists and the ability to restore purged users.

The product is written in CICS command language. CICS 3.1 and higher are supported.

TOSS/Mainframe Release 3.0 costs $23,500.
▶ NBS Systems
15 Mullen Road
Enfield, Conn. 06082
(203) 741-3244

FileTek, Inc. has expanded its support of IBM's Report Management & Distribution System (RMDS).

According to the company, its Storage Machines can work with RMDS applications written for CICS and IMS and for the already supported VTAM and TSO.

Companies that use the IBM system can now receive the benefit of optical storage without the penalty of program modification, the company reported.

FileTek is also offering interfaces to Goal Systems International, Inc.'s SAR Express, Mobius Management Systems, Inc.'s Infopac report management and distribution systems; a file viewer called Alternative to MicroFiche/MicroFilm Online; and Optical VSAM, a program for transparent access to VSAM files on Storage Machines for MVS applications.

The company offers client/server application development tool kits for Unix workstations on Ethernet local-area networks with Transmission Control Protocol/Internet Protocol and Token Ring LU6.2 connectivity for both OS/2 and DOS-based PCs.

The RMDS interface is priced from approximately $25,000, depending on users' host processor class.
▶ FileTek
6100 Executive Blvd.
Rockville, Md. 20852
(301) 984-1642

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Application Development

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Developers get ready for the Newton Toolkit

Analysts don't expect full availability until fall; applications must be built from scratch

By James Daly

So you think Apple Computer, Inc.'s Newton MessagePad is pretty neat. And you're thinking that maybe you'd like to pick one up and start building an application.

Sit tight.

Although Apple has fired the starting gun on the Newton product line, software developers interested in crafting applications for the handheld MessagePad organizer are going to be at the starting line for at least the next few weeks.

The Newton Intelligence operating system demands that developers start from scratch using the Newton Toolkit.

Although Apple officials said the tool kit is scheduled for imminent release, analysts such as Jeffrey Henning at BIS Strategic Decisions in Norwell,

Mass., said they do not expect it to be widely available until this fall.

The delay represents the classic conundrum for those attempting to establish a new operating system platform: Users will buy only if a wide range of applications is available, but software vendors will develop applications only if there is a large installed base of users.

Apple officials said about 100 developers are using beta-test copies of the tool kit. More than a dozen applications built using the software were shown at the Newton launch earlier this month.

In addition, officials at Apple's Personal Interactive Elec-

tronics (PIE) Division said they have received inquiries from 1,500 developers regarding the tool kit.

That is an impressive number for a device with an installed base of only a few thousand machines, Henning said. "It took Hewlett-Packard two years and $25,000 palmtops to interest that many developers," he added.

Follow the script

The tool kit has its own object-oriented programming language, called NewtonScript, which enables developers to program functionally as a series of reusable objects that speed the develop-

ment cycle.

"There's a lot of wind in Newton's sails right now," said Philip Ivanier, developer relations manager at PIE. Ivanier said Apple has licensed Newton Intelligence to major corpora-

Easel offers DBMS, CASE tools

By Melinda-Carol Ballou

Easel Corp. earlier this month introduced Enterprise Workbench, a package that offers point-and-click access to SQL relational database management systems, the ability to integrate upper-level computer-aided software engineering (CASE) tools and a 32-bit architecture.

In addition, Easel is completing work necessary to integrate legacy mainframe applications with PC client/server networks via a new tool: Renovator Plus.

Enterprise Workbench includes DB/Assist, which allows users to visually create, test and edit SQL application logic for access to IBM Systems Application Architecture databases in its first release. Support for other RDBMSs such as those from Sybase, Inc. and Oracle Corp. will follow next year, officials said.

Better late than never

Although Easel is playing catch-up to the other development tool vendors that offer such database access already, Easel users were enthusiastic about the new capabilities.

"The DB/Assist tool is very useful. You don't have to be an expert SQL user since it visually guides you through the syntax for SQL," said Mark Wilkinson, a PC analyst at Kemper National Insurance Corp. in Longrove, Ill., a beta-test site for the product. "The integration with [Workbench] is a lot cleaner than what we're currently using."

Also shipping with this release is Easel's Continuity for Enterprise Workbench, a visual tool for integrating External Source Format output from CASE vendors such as Bachman

Information Systems, Inc., KnowledgeWare, Inc. and Texas Instruments, Inc.

This support for upper-level CASE tools will also prove attractive to many users, according to Elizabeth Barnett, an analyst at New Science Associates, Inc., a consultancy in Westport, Conn.

"Users are increasingly aware that there needs to be ties between traditional upper-level CASE tools and client/server application generators," she said. "You have all these nifty client/server tools with no upper-CASE support, and Easel will now allow users to feed data in and out of enterprise environments."

Easel's Renovator Plus allows users to extend legacy applications and build client/server applications by integrating Workbench with CommBuilder, an Easel tool that automates the development of communications logic for 3270 and 3250 protocols. The combined tool set lets developers create graphical user interfaces for existing hardware while addressing the communications protocols.

This release of Workbench is based on 32-bit OS/2 Version 2.1, which takes advantage of OS/2's flat memory model, officials said. This also paves the way for support of Microsoft Corp.'s Windows NT sometime next year, they added.

Enhancements to Easel/Win and Easel/32 include interfaces to Microsoft's Open Database Connectivity and a new language feature for Easel/32. Dubbed a "table object," the new feature allows users to display large quantities of tabular data in a row-and-column format.

Pricing for the Enterprise Workbench Corporate Edition is set at $10,900 for OS/2 and $6,900 for Windows.

Oracle users say, 'Don't forget Unix'

By Kim S. Nash
REDWOOD SHORES, CALIF.

■ Oracle Corp.'s plan to move aggressively into the Windows development tools market is right on the money, as long as its Unix-based products do not suffer as a result, users said.

Although the overlap of Windows users with Oracle database users is relatively small, the number is growing, according to Mike Fisher, who represents the Delaware Valley Oracle User Group. Fisher did not have precise figures but said he has seen more demand for Windows utilities for all phases of development jump notably during the past year to 15 months.

"It'll probably grow much more, too, if we know they can get this stuff from Oracle itself," added Fisher, who is also a database administrator at PLS Industries, Inc. in Bethlehem, Pa.

Oracle plans to release a full set of Windows application development tools under its Cooperative Development Environment (CDE) banner before shipping a complete set for Unix [CW, Aug. 16]. However, all tools — both Unix and Windows — are expected out by the end of 1993 or early 1994, accord-

ing to Dennis Moore, director of CDE product marketing.

CDE is an umbrella term Oracle invented in March for 14 existing and new application development tools, including Oracle computer-aided software engineering (CASE) and report writers.

Defensive move

Oracle's Windows push is an attempt to counteract the Sybase, Inc./Microsoft Corp. one-two punch in the form of closely tied database and development products under Windows, said David McGoverenOreg, president of Alternative Technologies in Boulder Creek, Calif.

McGoveran also noted that Oracle is seeing some of its tools market swallowed up by hot client/server development vendors such as Powersoft Corp. and Gupta Corp. CDE for Windows is "no surprise," he said. "Everyone wants to be a Powersoft these days."

Meanwhile, Oracle's Windows push pleased users interviewed recently. Buffalo State College in Buffalo, N.Y., has used Oracle databases and utilities for about four years, said Rob Smith, senior programmer/analyst at the college. Buffalo State currently runs Oracle CASE tools on a Digital Equipment Corp. VAX.

"We'd do more [Windows] development in the Oracle environment if we had the products to do it with," Smith said.

EDA/SQL helps Ciba decentralize data

By Thomas Hoffman
BASEL, SWITZERLAND

Ciba-Geigy International AG, the Swiss chemicals giant based here, decentralized its information systems operations in 1990. Since then, the firm has been able to provide its users with greater access to corporate data, particularly through the use of SQL-based software tools.

For example, Ciba-Geigy programmers are using Information Builders, Inc.'s EDA/SQL fourth-generation language (4GL) software to download financial data from the company's IBM DB2 and other midrange and mainframe databases to Lotus Development Corp.'s 1-2-3 and Information Builders' Focus PC software packages, according to Nicholas Palmer, head of languages and tools in central information services at Ciba-Geigy.

Financial controllers within the company then use the decentralized financial applications to determine whether cash movements are meeting the firm's objectives.

Palmer said the 4GL software has enabled Ciba-Geigy to access data from its IBM DB2, DL/1 and other database systems without having to redevelop the databases for its distributed systems, including OS/2.

"Decentralization of the financial reporting would have been enormously expensive with the new programming on a centralized basis," Palmer said.

Although Palmer said the company has not yet determined the dollar savings from the initiative, he said it expects to save more than five man-years of application development time by harvesting the mainframe systems with SQL tools. "That's for one application. We expect over the years to make further savings with a number of other applications," Palmer said.

Since Ciba-Geigy began using the EDA/SQL package in full production in the third quarter of 1992, 50 users have tapped into the distributed financial applications. Ciba-Geigy plans to finish testing EDA/SQL for compliance with Microsoft Corp.'s Open Database Connectivity by October. After that, Palmer said he anticipates an additional 100 users will begin using the systems within 12 months.

Nicholas Palmer: *Ciba expects to save five man-years of development time on one application alone*

Gembase 5.0 aids move to client/server

By Melinda-Carol Ballou
REDWOOD CITY, CALIF.

Ross Systems, Inc. is now shipping Gembase 5.1, a new version of its fourth-generation application development tool that targets both legacy and client/server environments, company officials said.

Version 5.1 allows data requests to be routed to multiple servers to improve application performance, increasing transaction speed for host-based and client/server applications, according to the company.

It also allows developers to create applications where the processing is performed on either the client or server, depending on which would provide the best processing load.

Gembase applications can be designed to run on PCs, terminals or both and can provide a smooth migration path for those desiring to make the transition from host-based to client/server environments, officials said.

Gembase 5.1 is shipping now.

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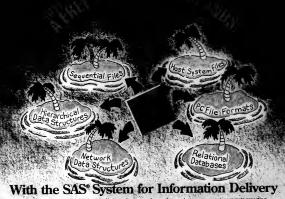
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Inc. said it plans to add access to Oracle Corp.'s Oracle 7 database in the next release of Blyth's application development tools. Omnis 7 Version 2.0 is scheduled to ship later this summer and is expected to support Oracle access from Windows-based PCs. Oracle-to-Macintosh support is in the works, Blyth said.

KnowledgeWare makes plans

KnowledgeWare, Inc. announced a new distribution strategy for its client/server

development tools that targets third-party channels. Dubbed the Client/Server Alliance Program (CAP), the program targets system integrators and consultants, 35 of whom have already been accepted as members. CAP includes a reseller program as well as products, services, support and training.

Separately, KnowledgeWare officials said there are no plans to cut back on Application Development Workbench (ADW), its mainframe development tool,

despite employee cuts in areas relating to ADW development and a ramp-up in client/server development.

Support for Alpha apps

Powersoft Corp. and Digital Equipment Corp. announced that PowerBuilder and the Powersoft Enterprise Series will support DEC's Alpha-based products running Windows NT and Rdb, DEC's relational database management system. Separately, Uniface Corp. announced an agreement under which DEC will develop and resell applications using Uniface's client/server tools.

Building kit for imaging

Media Cybernetics, Inc. in Silver Spring, Md., has announced a tool kit for building imaging applications for Microsoft Corp.'s Windows NT, Windows, DOS, Macintosh, OS/2 and Unix environments. Available immediately, Halo Advanced Imaging Library is targeted at users who build scientific programs, such as medical pathology and geographic information systems.

Sybase combines languages

Sybase, Inc. plans to work with Intermetrics, Inc. to build a precompiler that incorporates Samedl, a high-level language that combines SQL with Ada. Samedl stands for SQL-Ada Module Description Language. The Sybase Samedl precompiler will be aimed at government users and will be compatible with Sybase's SQL Server relational database, the companies said.

The company said product is due out by the end of the year; pricing was not available.

Newton Toolkit

tions such as Motorola, Inc., Sharp Corp., Siemens AG, Cirrus Logic, Inc. and Kyushu Matsushita Electric.

By using NewtonScript and high-level communications application programming interfaces (API), Frazier said, developers can also write applications that take advantage of Newton's underlying communications capabilities.

Eye on the future

The NewtonScript communications API, for instance, provides developers with a consistent interface to various transports. By writing to the high-level APIs, applications can run on whatever communications media are available now and in the future.

For example, an application that transfers information over a modem would be able to transfer information via a wireless connection by selecting a different medium.

The integration of the communications architecture with the object-oriented database and handwriting recognition and intelligence software allows every application with the devices to be communications-aware, according to Ivanier.

The Indus Group, Inc. has made its Passport Software Solutions application products available across IBM's CICS family of products.

According to the company, Passport industrial applications designed for process and manufacturing plants have been ported to both OS/2 CICS and CICS/6000.

A set of Business Migration Tools used in conjunction with the product translate code and provide utilities.

Passport's applications include document management, work management, inventory control, engineering change control, purchasing, equipment tag-out, fugitive emissions management and personnel qualifications data.

Passport modules range in price from $59,000 to $350,000.

▶ *The Indus Group*

60 Spear St.
San Francisco, Calif. 94105
(415) 904-5000

Blue Sky Software has announced that it will start shipping RoboHelp Version 2.0, the company's Windows-based Help authoring tool, next month.

The product includes more than 100 new features, allowing it to design, create and test comprehensive, on-line, context-sensitive Windows Help systems,

the company said.

RoboHelp 2.0 also offers the ability to use a single text source for both the Help system and printed documentation. It has a fully integrated environment that enables users to access all the new features of the Windows 3.1 Help Engine, according to the company.

A feature called Error Wizard takes users to the exact place of a potential error before compiling and provides an explanation.

RoboHelp 2.0 costs $495.
▶ *Blue Sky Software*
Suite 3
7486 La Jolla Blvd.
La Jolla, Calif. 92037
(619) 459-6365

Data Access Corp. has announced the release of a graphical implementation of its object-oriented fourth-generation language for the Windows environment.

According to the company, DataFlex for Windows was designed for the creation of true event-driven Windows applications because it is object-oriented.

Windows utilities included in Data-Flex for Windows accelerate the creation of graphical user interface applications, the company said. New controls, presentation classes and communications support is provided.

The product also has a feature that enables applications to be built that can resize themselves to the user's hardware environment.

Development licenses cost $795.
▶ *Data Access*
5753 Miami Lakes Drive E.
Miami Lakes, Fla. 33014
(305) 238-0012

Product shorts

ACI US, Inc. has started shipping Object-Master Universal Version 2.0, an upgrade to its source-code editor and development tool. Enhancements facilitate the development of applications created in the MPW, Think C, Think C++ and Think Pascal environments, the company said. Cost: $365. ACI US, Cupertino, Calif. (408) 252-4444. . . Horizons Technology, Inc. has announced the availability of its Fuzzy Search Engine Developer's Kit. According to the company, the product allows users to embed a cost-effective information search-and-retrieval tool as a native feature in Windows or DOS applications. Cost: $1,995, plus variable runtime fees. Horizons Technology, San Diego, Calif. (619) 292-8331.

GE WHIZ

As General Electric Corp.'s first CIO, Hellene Runtagh will play a pivotal role in creating a lean, "borderless" corporation that hopes to dominate all 15 of its markets.

GE's Hellene Runtagh: "One of the biggest mistakes a CIO can make is to tell a client, 'Call me in once you've got a game plan.'"

BY NELL MARGOLIS

Whatever Jack Welch wants, he usually gets. And these days what General Electric Co.'s chairman wants is to propel each of his conglomerate's 15 business divisions to the top of their respective sectors. And he wants to do it by wedding the resources of the $60 billion, 230,000-employee corporate giant to what he calls the "speed and soul" of an entrepreneurial start-up.

That's why Fairfield, Conn.-based GE, the nation's fifth-largest conglomerate, is in its fourth year of a relentless top-down transformation. The challenge is formidable: Dissolve the gridlock of traditional corporate categories into a climate of "integrated diversity." The aim, Welch says, is to create an efficient, effective flow so that the best business practices can be transplanted to each individually empowered corner of the company.

That's also why Welch created GE's first-ever corporate chief information officer post last fall and chose Hellene Runtagh to fill it. The move, observers say, gives Welch a better-than-average chance of keeping GE ahead in aircraft engines, major appliances, materials, aerospace, broadcasting and other important core markets.

"Information and information management are critical to the success of the [integrated diversi-ty] concept," says Du Wayne Peterson, an information systems management consultant and former Merrill Lynch & Co. CIO. "Welch recognized that early on."

Peterson says, however, that driving thought information effectively through a new model corporation requires a rethought role for the CIO.

Indeed, the new GE model has no internal boundaries. Resources of every kind are continually mustered, focused, disbanded and reassembled to serve widely diverse customers. Only a CIO steeped in the business yet removed from day-to-day operations can hope to help effect so sweeping a change.

Runtagh seems to have the

GE whiz

stripes. She joined GE in 1970 as a human resources trainee right out of Pennsylvania State University. Later she did tours in the manufacturing and marketing arenas.

When tapped for the corporate CIO job, Runtagh was serving as president and chief executive officer of GE Information Services (GEIS), GE's 2,800-person information technology subsidiary, a position she still holds along with her new corporate post.

Creating community

But no CIO alone can plumb the disparate aspects of the business deeply enough to do the job, Runtagh says. So GE turns to its CIO Council — a group chaired by Runtagh and composed of the CIOs of each of GE's business units. The council meets quarterly and communicates daily, producing a steady flow of questions, suggestions and observations.

Runtagh, based in Rockville, Md., says the group's sharing is a powerful tool for meeting Welch's vision of "integrated diversity."

"For instance, if one business implements a LAN, aren't the people who worked on that project the best experts for another business to consult when it's thinking of doing the same thing?" she asks. "Without something like the council, the second business well might relearn the wheel without anyone even realizing so wasteful an action had occurred."

The Information management arena, Runtagh continues, must be seen as a change agent, where people want change. "No more

boasting about 'zero attrition,' where the good news is that we haven't lost anyone in three years and the bad news is that we haven't lost anyone in three years," she says.

Lofty words — but easier to believe from the head of an 18-organization that is not only sending its staffers out into the businesses on a regular basis but also attracting business professionals into IS (see stories below and page 112). Runtagh envisions an exciting but "with people constantly coming and going from different bases. What a fantastic place from which to see the big picture, to get further stretched and challenged."

Swift technological change, increasing competition, more sophisticated customers and virtually overnight globalism guarantee that IS will continue to play a pivotal — and customer-sensitive — role.

"One of the biggest mistakes a CIO can make is to tell a client, 'Call me in once you've got a game plan,'" Runtagh says. "That's a disaster waiting to happen."

If information management isn't involved as soon as a business need emerges, she says, the game plan that evolves is unlikely to be optimal. "Information management, correctly conceived, carries within it the functional body needs of the company," she says. "You can't divide an organ away."

She seems sold on the importance of the IS function: "I'm going to make a prediction: I think IS management is going to emerge as the future boot camp for CEOs."

If that vision pans out, Run-

tagh's mix of technical credibility and catalytic inspiration is likely to be a major reason why, according to many of her colleagues.

"Hollene has made it clear that customer satisfaction is her No. 1 priority," says Geri Stoner, vice president of customer quality at GE. "She frequently participates in our daily quality reviews. She issues bulletins. There's constant follow-up and follow-through."

GE's Motors Division IS chief Jack Spratto adds: "What Hollene's brought to the party is the call to say, 'We're gonna do this, and we're gonna make it work.'"

And the fact that the CIO's attitudes as well as her actions are clearly endorsed by the chairman, Peterson says, enhances her effect.

Even this early in the game, the approach of top-down buy-in is generating bottom-up payback, Runtagh notes. Recently, "a very 'thing-oriented' [internal] client came up to me with a brochure that knocked my socks off," she recalls. "It listed all the technology-enabled services his business would provide for customers." For a manager who had formerly thought of IS as extraneous to his mission at best, she says, the shift was stunning. "Here he was, consciously using IS as a differentiator."

Observers agree that the earmarks of the change-agent CIO — enthusiasm, pragmatism, the ability to motivate people rather than issue orders, the rooted self-confidence that lets one empower others without feeling threatened — are embodied in Hollene Runtagh.

And that's just what Jack Welch wants.

Geri Stoner: Departing for business battles

When critical business goals are targeted at GE these days, "IS is brought in up front and kept involved at every turn," says Geri Stoner, vice president of customer quality.

Stoner is an eight-year GEIS veteran who left the IS unit "to broaden my perspectives" three years ago; she is now at her second business executive's post. Last year she analyzed her division's customer tracking tool and "found that it was a very effective tool but not a very good one."

That was because the software told plenty about who called and when but not much about why. "If you looked to use the reason for the call, 80% came up as 'general,'" she says. "It's very hard to fix 'general.'"

So the quality department cashiered out a whole-sale system revision, set in the context of a departmental re-engineering that is still under way.

At the project's outset, she recalls, "IS people sat down with the call analysts and watched how they

did what they did." Only after they understood the process, the goals and the gulf between the two did the IS staff members begin to suggest technological approaches, Stoner says.

"IS was very rigorous in demanding that we know up front what we wanted accomplished," she says. "Once we did and could communicate it to them, they offered alternatives, explaining the relative advantages and disadvantages; which ones were less complex but would bring in wins sooner vs. longer-term but perhaps deeper benefits."

For the business folks, Stoner says, the interplay was an empowering experience. "IS helped them see that they were a critical part of the information that is so important to the company," she says.

As for the IS folks, Stoner says, "They enjoyed the heck out of being with the business — getting to know the real question and knowing that they could shoulder world provide answers, not repair problems. It got to the point where they were having weekly lunches, just to exchange more information."

— Nell Margolis

At GE Motors Division, E-mail has led the way

Two years ago, cost pressures drove GE's Fort Wayne, Ind.-based Motors Division from a centralized Honeywell Bull, Inc. mainframe platform to a client/server system based on DEC-compatible PCs, says IS manager Jack Sprano. Using router technology, the company can replicate 25 networks into a single Token Ring network that spans the $1.2 billion division's 25 factories.

"Now any PC can speak to any PC," Sprano says.

Sounds like a happy ending — but for the Motors Division and the IS group that helped it onto the new system, it was also an unexpected beginning. An electronic mail system put in basically as an afterthought, Sprano says, is re-engineering the business.

E-mail for the masses

At an estimated 65 cents a message, he says, the Motors Division's earlier mainframe-resident E-mail system was too pricey a treat to be widely used, he notes. But the advent of the client/server network has made a dramatic difference.

"We're doing so much on PCs now that the incremental cost of E-mail adds up to peanuts," Sprano says. As for administration, he adds, the division, which gets central IS support from Bethesda, Md.-based information technology subsidiary GEIS, is "getting by with just about what we had before. As long as you've already invested in the Token Ring, E-mail starts to make a lot of practical sense."

And dollar sense, too: Sprano estimates that the GEIS-designed local-area network-based E-mail system will save the Motors Division $500,000 a year.

However, he says, "The real hit is, there are so many more people using it." Today, "when you've got a thought, you can hold it, you can play phone tag — or you can put it down right away. The guy in the field writes a note on competitive

reality, 50 of us back here read it, add our own comments and send it further on."

In-house expert

Little wonder, then, that Sprano is doing double duty as head of GE's E-mail "center of excellence"; a volunteer ad hoc committee tightly focused on exploring and disseminating's technology or methodology that is likely to be put to beneficial use elsewhere in the company.

"We're looking at technology that would allow us to send drawings via E-mail by sending them out as text and receiving them in graph form," Sprano says.

Right now, he says, the choice lies between current electronic drawing transfer alternatives that are not yet cost-productive and GEIS' present offering, which lets a user receive a message via E-mail and send it out via fax at an affordable cost but with a loss of resolution and time.

At the moment, the latter is holding the line. However, Sprano says, "sending drawings back and forth in an open technology is key to us. We're not letting up on that."

Other GE businesses are still using mainframe-based E-mail, Sprano says — but not for long. Six, he says, are "implementing LAN-based E-mail. [The] Lightning [Division] has been in; they're trying to steal everything they can." Last month, a delegation from the post accounting unit requested — and received — a full-day E-mail site visit hosted by Sprano and his band of volunteers.

"I don't know what will happen if I get a run on my guys," acknowledges Sprano, whose staff members are all moonlighting and whose war chest is nonexistent. "Every business wants someone to come out and help them set up an E-mail system like ours."

— Nell Margolis

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HEWLETT PACKARD

Monitoring employees

Information systems designs play a key role in the conception and creation of electronic performance-monitoring systems. Such systems already monitor some 10 million workers, and while the goal is to raise worker productivity, many systems fail. Such projects raise many social and ethical issues. Chances for success are best when workers are invited into the development process, systems are flexible, high performers are rewarded, and only meaningful activities

are measured.

Source: "Developing an employee-centered electronic monitoring system," Kristen Bell De Tienne and Nelson T. Abbott, *Journal of System Management*, August 1993, (216) 243-6900.

Network printing plans

The insurance industry remains an aggressive user of high-speed electronic printing. A new survey by Xplor International, the document systems profes-

sional association, found that more than half of 57 firms polled had implemented a distributed printing technology. Two-thirds said they had a corporate printing strategy. Only about one quarter had integrated network and mainframe publishing, however.

Source: Xplor International survey, (310) 373-3633.

Insurance downsizing

Meanwhile insurers are racing ahead

with downsizing plans. Nearly 90% of 120 insurers polled recently by the Life Office Management Association (LOMA) report having local-area networks. That compares with 80% two years ago and approximately 60% in 1989.

Security efforts have also risen dramatically. Approximately 67% have an official company plan for dealing with viruses, compared with just 15% in 1989.

Source: Life Office Management Association survey, (404) 951-1770.

Re-engineering Your Business

By Daniel Morris and Joel Brandon, McGraw-Hill; hardcover; 247 pages.

Re-engineering, somewhat surprisingly, has become a hot topic in the popular press. Consider the heady ascent of Mike Hammer and James Champy's recent book, *Reengineering the Corporation*, on the *New York Times* best-seller list.

The latest entry in the *Re-engineering Your Business*, described by its authors as a "brass tacks" book to help companies make process redesign a reality. The work discusses the latest modeling and simulation techniques, ways to design organizational structures and how to implement change without disrupting daily operations. The authors are re-engineering consultants.

Electronic Marvels at State Farm Mutual

By Myron G. Wilkie. Distributed by Alamo II Bookstore, Normal, Ill.; hardcover; 388 pages; $27.95.

Ever wonder what the IS history of your organization would look like if someone had kept meticulous records of its progress during say, the last 40 years? You'd have a pretty complete one if Myron Wilkie had been your IS boss. Wilkie, who spent 34 years at State Farm Mutual Automobile Insurance Co., has produced an exhaustive and careful account of how a pioneer IS department grew from four people in 1955 to 4,800 today. Wilkie, who retired in 1980 as assistant vice president of IS, walks readers through six computing eras into modern times.

Although the detail presented here will probably be most interesting to those in the insurance industry and other pioneering peers, Wilkie has struck on something the value of IS history. With so many companies detonating so much these days, firms that remember where they came from stand a much better chance of successfully navigating their future course.

Calendar

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anyan

The CW Guide to Internetworking Devices

Linkage lineup

LAN SWITCH

INVERSE MULTIPLEXER

COLLAPSED BACKBONE

Just when you'd figured out the difference between a router and a bridge, along comes a whole new generation of interconnect devices called switches. Here's a guide to help you stay on course as you inspect your internetworking options.

BY FRED J. McCLIMANS

For an example of just how diverse the networking field has become, check out the diagram (pages 118-119) of the National Auy Company, U.S.A., which highlights many of the new products and capabilities on the market today.

I f you think that more than one object can't possibly occupy the same space at the same time, put aside modern physics and examine the internetworking market. Never before have so many vendors tried to hop on the same musical chair.

Why? Perhaps they are inspired by Wellfleet Communications, Inc., a router manufacturer rated the fastest growing company in the U.S. by *Fortune* magazine for the last two years.

Or perhaps they want to join Cisco Systems, Inc., SynOptics Communications, Inc. and Cabletron Systems, Inc., all of which, with Wellfleet, will likely close in on a combined $2 billion in sales this year — all in a market that barely existed five years ago.

With companies beginning to value leading-edge networking as a strategic asset, this market shows no signs of letting up.

One of the reasons internetworking has taken off is the maturation of current local-area network technology, including network interface cards (NIC) and shared-segment LAN hubs. As prices drop beneath the $100 per port cost on both NICs and hubs, more users can now economically justify network expansion.

Routing technology has also benefited from the growing maturity of both hardware and software. Once difficult and onerous, routing can now be easy to use and manage.

Making this market even more interesting is the fast-growing requirement for LANs to support legacy systems, such as good old Systems Network Ar-

HUB

chitecture (SNA). Here we see a number of companies taking advantage of IBM's own efforts to sell into this market, probably best demonstrated by the movement of many routing companies into the SNA/Synchronous Data Link Control (SDLC)/Logical Link Control (LLC) conversion market (i.e., SNA tunneling or encapsulation).

Complicating things is the choice between traditional LAN technology and a new generation of switching LAN technology, including products that provide "port" switching, "segment" switching and ever "virtual" LAN switching (see story page 121). New "cell-relay" as well as Asynchronous Transfer Mode (ATM) technologies have already begun reshaping both hubs and routers.

BRIDGING ROUTER

When trying to cope with all the products and network architectures on the market today, managers must realize there is no single answer. Most users employ a range of technologies.

Collapsed backbone networks are often interconnected with distributed Fiber Distributed Data Interface technology; SNA and LAN integration are often provided by both SDLC tunneling and SDLC/LLC Token Ring attachment in the same network. LAN segment switches work to congestion breakers front-ending the router-based backbone.

The key here is to abandon preconceived notions about single-technology solutions and the best products that need to match your immediate and long-term needs.

SDLC CONVERTER

McClimans is program director of the local-area communications service at Gartner Group, Inc. in Stamford, Conn.

GLOSSARY

What's what

Internetworking devices

Leading vendors include Cisco, Wellfleet, Digital Equipment Corp. and 3Com Corp.

BRIDGE: Connects two or more LANs to form a single larger LAN. Can also filter traffic to each LAN segment, minimizing unnecessary broadcasts.

ROUTER: Connects two or more LANs but allows each LAN segment to maintain its independence. Creates logical addressing domains to control LAN packet routing. Most routers support the concurrent use of multiple protocols.

Traditional workhorses

Traditional players still rule here, including IBM, DEC, Newbridge Networks Corp. and Timeplex, Inc.

FRONT-END PROCESSOR: Controls traffic or communications between a mainframe and user/LAN devices.

GATEWAY: Allows devices on different networks, using different protocols, to communicate (i.e., Apple Computer, Inc. AppleTalk to TCP/IP).

PROTOCOL ASSEMBLER/DISASSEMBLER (PAD): Allows a user to access a protocol-specific WAN, such as a frame-relay or ATM service.

TERMINAL SERVER: Provides LAN access to terminals or workstations incapable of direct network access.

New technologies

COLLAPSED BACKBONE ARCHITECTURE: An increasingly popular network design that uses a high-performance router or switch at the center of the network. Hardware reliability is key.
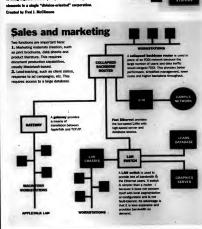
SDLC/LLC CONVERTER: Allows IBM SNA SDLC data streams to be encapsulated into an LLC LAN-based packet for transmission across a LAN segment.

INTEGRATED NETWORK DEVICE: Integrates a LAN hub or terminal server with a remote bridge or router. A niche product today, these devices will grow considerably as vendors offer cost savings and simpler management. Ideal for remote users with little technical expertise.

ROUTE SERVER: Helps create, maintain and disseminate information on paths through a switched network. Currently in an early development stage.

VIRTUAL LAN SWITCH: Provides each connected user with his own dedicated LAN (called LAN-per-port). Also provides the ability to create logical workgroups to improve LAN flexibility.
— *Fred McClimans*

Any Company, U.S.A.

Actually, these diagrams of a large, state-of-the-art multidivision manufacturing enterprise don't represent just any company. But the capabilities required are very real for many companies, large and small, that are in the process of either migrating away from older legacy systems or trying to bring together formerly disparate networking elements in a single "division-oriented" corporation.
Created by Fred J. McClimans

BUILDING 1
HUMAN RESOURCES

BUILDING 2
RESEARCH & DEVELOPMENT
MARKETING

ATM

ATM

FDDI NETWORK

BUILDING 3
INFORMATION SYSTEMS

ATM

Sales and marketing

Two functions are important here:
1. Marketing materials creation, such as print brochures, data sheets and product literature. This requires document production capabilities, usually Macintosh-based.
2. Lead-tracking, such as client status, response to ad campaigns, etc. This requires access to a large database.

COLLAPSED BACKBONE ROUTER

WORKSTATIONS

A collapsed backbone router is used in place of an FDDI network because the large number of users and data traffic would outspeed FDDI. This provides better performance, simplified management, lower costs and higher backplane throughput.

ATM

CAMPUS NETWORK

A gateway provides a means of translation between AppleTalk and TCP/IP.

GATEWAY

Fast Ethernet provides the low-speed LANs with high-speed server and database access.

LEADS DATABASE

LAN CHASSIS

LAN SWITCH

A LAN switch is used to provide lots of bandwidth to the Ethernet users. A switch is simpler than a router because it does not concern itself with local segmentation or configuration and is not fault-tolerant. Its advantage is that it is less expensive and provides bandwidth on demand.

GRAPHICS SERVER

MACINTOSH WORKSTATIONS

APPLETALK LAN

WORKSTATIONS

Research & development

This department's heavy work in CAD/CAM, graphics modeling, code generation, programming and product design means each user needs high performance and the ability to transfer large files to other developers. As a result, much attention is paid to giving each user high bandwidth directly to his desktop and using switches to increase bandwidth when necessary.

WORKSTATIONS

LAN CHASSIS FDDI

ROUTER

FDDI direct to these desktops satisfies the need for high bandwidth.

MANAGEMENT CONSOLE

FDDI HUB

FILE SERVER

CAMPUS LAN

ATM

This router provides ATM access and SDLC tunneling through the main network.

ROUTER

LAN SWITCH

Segment switching is not as fast as LAN-per-port, but users still get higher bandwidth.

SDLC DEVICE

INVERSE MULTIPLEXER

An **inverse multiplexer** provides high bandwidth on demand to remote R&D sites.

WORKSTATIONS

LAN SWITCH

LAN-per-port switching provides each user with his own LAN segment, meaning each user is guaranteed 10M bit/sec., especially with the workstation directly attached to the switch.

PUBLIC SWITCHED NETWORK

Human resources

Here, users need access to many documents, including memos, employee databases, accounting records, etc. Much of these are placed on an imaging server, so there's a need for heavy file storage and fast access to the imaged material. Data sharing among workgroups is also important.

WORKSTATIONS

LAN CHASSIS

LAN CHASSIS

WORKSTATIONS

BRIDGE/ ROUTER

IMAGE SERVER

FDDI BACKBONE FOR BUILDING 1

The **chassis hub** contains multiple stackable hubs. It's used here in place of a stackable hub because it can support routing, switching and management modules for large configurations of more than 20 users, up to 200.

A **bridging router** is used so that the workgroup function as a single LAN (as in a bridged network) and can therefore share data easily but are protected from the building's FDDI backbone by the router. The router "firewall" provides a clear segmentation between the human resources LAN and the backbone network so that no unwanted traffic comes through.

Data center

In the data center, there are data repositories holding video and imaging data as well as IBM and DEC VAX processors. FDDI networks provide an extremely reliable high-speed network between the processors and database systems as well as high data access from remote users in other buildings.

SNA FRONT-END PROCESSOR

SDLC CONTROLLER

An **SDLC controller** allows SNA traffic to be put on a token ring network.

TOKEN RING NETWORK

FRONT-END PROCESSOR

SNA DEVICE

A **front-end processor** controls traffic between the mainframe and LAN devices.

TRANSLATION BRIDGE

Translation bridges are often used with token ring because they don't just encapsulate the data in order to send across FDDI (Ethernet LANs); they translate it, if available here.

FDDI

ROUTER

MULTIPLEXER

WAN

A **router** provides a "firewall" between the backbone and the WAN.

A **multiplexer** allows the router and mainframe to share the WAN connection to remote processing or storage site.

ATM

CAMPUS NETWORK

ATM switches provide high-speed switching to the campus network and across FDDI networks.

WHISTLING
UNDERWATER.

WALTZING TO
RAP MUSIC.

WHAT'S NEW IN ROUTERS

A summary of tricks

Few technologies are evolving faster than the multiprotocol router. Once a simple LAN interconnect tool, routers have grown into products capable of supporting not only LANs but also many traditional legacy systems.

PRIORITIZATION enables users to prioritize the different types of traffic. Because higher-priority data is always forwarded first, this feature can be critical to managers trying to support time-sensitive applications. Now a common feature in many multiprotocol routers, prioritization is usually supported at little or no extra cost. Prioritization can be based on source/destination addresses or protocol type. However, because most routines apply prioritization only on the first "access" port into the network — and intermediate routers typically do not continue the priority service — prioritization is a limited service.

CLASS-OF-SERVICE goes beyond prioritization to provide an end-to-end "quality" transmission to a protocol or device. Very important to IBM SNA traffic, class-of-service provides better or faster routes throughout the network for important traffic. True class-of-service is not available in most router products.

DIAL-ON-DEMAND routing combines the traditional router with an asynchronous dial-out modem that initiates a connection to a remote site whenever a remote message is generated by the local network. This can offer significant cost savings for users who do not have enough traffic to justify a dedicated leased line. This is still a relatively new technology supported by only a handful of vendors, such as Telebit Corp. and NEC Technologies, Inc.

INVERSE MULTIPLEXERS typically dial bandwidth in 56K bit/sec. increments over a Fractional T1 service, unlike most dial-on-demand products, which use asynchronous dial lines. Inverse multiplexers can be used to dial up (or increase) bandwidth between two sites to handle heavy bursts of traffic.

Inverse multiplexers from vendors such as Newbridge Networks Corp., Ascend Communications, Inc. and Teleos Communications, Inc. can be coupled with routers to provide supplemental bandwidth for large file transfers or as backup connections. This function is likely to be integrated directly into routers within the next 18 months. This technology is very important for users trying to build redundant network connections.

COMPRESSION is used to shrink the size, or amount, of information being sent across a wide-area link. Compression operates only on an individual circuit by replacing repetitive patterns with a compression code. This can result in significant increases in bandwidth, often 2-to-1 or 3-to-1, meaning that lower-speed circuits at low costs can replace high-speed, high-cost circuits. Most router vendors support some type of compression at little or no extra cost.

BANDWIDTH SHARING allows multiple WAN connections between two sites to share transmission responsibilities. This is often referred to as load-balancing and can be used to provide live backup connections or high levels of bandwidth (i.e., three T1 circuits to provide a total of 4.5M bit/sec.). Most router vendors provide this function as part of the base router system.

SNA TUNNELING (or encapsulation) allows SNA traffic to be encapsulated in a LAN packet and routed through an Internet using the LAN packet-routing functions. SNA packets are usually encapsulated in an Internet Protocol (IP) packet with the IP addressing placed on fixed "virtual circuits" between the SNA access and egress points. Once within the router network, the traffic is routed according to standard IP routing tables.

This technology is key for managers trying to consolidate LANs and SNA networks. Many vendors offer proprietary solutions, usually at little or no extra cost but often lacking in functionality and flexibility.

COLLAPSED BACKBONE ROUTING is a method for improving the bandwidth and manageability of a backbone network. In place of the traditional architecture, a single high-performance router is installed. Each individual LAN is given a dedicated LAN port on the collapsed backbone router; the backplane of the router serves the same role as the traditional backbone network.

The use of a router as the collapsed backbone node will likely give way to switching systems during the next two to three years. Managers using a collapsed backbone architecture need to evaluate features such as product reliability and backup, as this type of product is generally a single source of failure in many networks.

— Fred J. McClimans

MAKE WAY FOR SWITCHES

The next generation

Traditional local-area network technology operates in a shared-segment manner. That is to say, Ethernet, Token Ring and Fiber Distributed Interface LANs force attached users to share the entire available bandwidth with all other users on the LAN. LAN switching systems, on the other hand, are reshaping this "shared access" approach. There are a number of different types:

PORT SWITCH: This device allows an administrator to remotely redirect traffic among incoming ports on a LAN hub and the shared-segment backplanes within the hub. The administrator can reconfigure which users are connected to which shared segments on the backplane of a LAN hub. Bytex Corp., Chipcom Corp. and LANnet Data Communications are strong here.

SEGMENT SWITCH: A segment switch is a fast, economical way to break up a large LAN into several smaller components. Like a learning bridge, it forwards LAN packets among LAN segments — but only if the packet is truly destined for that LAN segment. Users typically deploy these devices to reduce the number of users on a single shared segment, thereby improving LAN access. Companies such as Artel Communications Corp., Alantec, Inc. and Synernetics, Inc. are strong here.

FRAME SWITCH: A device that functions like a segment switch for wide-area traffic, such as X.25 or frame relay.

CELL SWITCH: A device that switches cells (such as ATM) instead of LAN frames or packets. Cell switching is used by vendors such as LANnet, Fore Systems, Stratacom, Inc. and Newbridge Networks Corp., although many others will be shipping products within the next year that provide this type of support. Cell switching will likely be used at the core of many segment and frame switches in the next two to three years.

— *Fred J. McClimans*

QUIZ

How much do you know about internetworking?
By Scott Bradner

1. You can use routers from different vendors in the same network.

true   false

2. With APPN, it is easy to integrate SNA into a multiprotocol enterprise network.

true   false

3. The Point-to-Point Protocol (PPP) allows you to connect routers from different vendors over all WAN links.

true   false

4. SNMP guarantees that a network manager can control all internetworking devices using a standard database.

true   false

5. You can only use 30% of an Ethernet's 10M bit/sec. data rate.

true   false

6. 100M bit/sec. FDDI is always better than 10M bit/sec. Ethernet.

true   false

7. You should not use TCP/IP in new data networks because you are running out of network addresses.

true   false

8. You can reduce overhead traffic by using a router instead of a bridge to connect two LANs over a wide-area link.

true   false

9. You should use bridges instead of routers because they are so much faster.

true   false

10. A popular network design puts all your eggs in one basket.

true   false

Answers on page 122

How did you do?

1. TRUE. In most cases you can mix routers from different vendors if they interconnect over an Ethernet, FDDI or Token Ring LAN. The standards for the encapsulation of data and the format for rout-ing information on LANs are well-estab-lished and implemented for most proto-cols.

2. FALSE. IBM has licensed its Advanced Peer-to-Peer Networking (APPN) soft-ware to a number of router vendors, but the resulting products have not yet proved themselves in the real world. A number of vendors have announced plans for APPN products, and there should be a variety to choose from soon.

3. FALSE. The use of the Point-to-Point Protocol (PPP) with Transmission Con-trol Protocol/Internet Protocol (TCP/IP) has been standardized, and products have been shown to interoperate for sim-ple data transfer. Some problems have been found when using advanced routing protocols such as Open Shortest Path First, but things work for the most part.

The story is quite different for other protocols. A version of PPP that includes multiprotocol support is working its way

through the standards process, but final adoption and implementation are still some time away.

4. FALSE. There are standards for data-bases — called Management Informa-tion Bases (MIB) — to be used by Simple Network Management Protocol (SNMP) for different types of devices, but some vendors don't implement them fully or skip them altogether and roll their own. Just because a vendor claims its net-work-based device uses SNMP does not mean it uses the standard MIB for the de-vice. Products that use incomplete or nonstandard MIBs force the network manager to customize the management station.

5. FALSE. This is an old fable told around the campfires of Token Ring salesmen. Ethernet does have a problem if you have too many nodes on the same LAN. Even with this limitation, though, it is easy to make use of more than half an Ethernet's theoretical bandwidth, and the peak is closer to 85% than to 50%, even with 100 nodes per LAN.

6. FALSE. If you have 20 nodes sharing an FDDI ring, each of them can use, on average, 5M bit/sec. If you have the same 20 nodes connected to ports on an Ether-net switching hub, each one will be able to use almost twice as much. You will not have as high a peak transfer rate, but the average will be better, and this solution can be less expensive than an FDDI ring.

7. FALSE. There has been a scare about this in the last year or two, but current projections show that this network num-ber exhaustion will not occur until about the year 2000. By that time, the Internet community will have agreed on and de-ployed an alternative to TCP/IP.

8. TRUE. The use of routers in place of bridges will eliminate almost all broad-cast traffic from the wide-area network link. Although some routing protocol traffic will be required between the rout-ers, this will almost always be far less than the broadcast traffic displaced.

9. FALSE. In the Ethernet environment, both bridges and routers can meet the theoretical limits of the network technol-ogy. There is not much difference after you reach that point.

10. TRUE. A number of network design-ers now believe that bringing all of the LANs in an enterprise back to a common location and interconnecting them with a single high-speed router provides for easy management and very high speed. This is the ultimate in collapsed back-bones: The router backplane serves as the campus backbone.

As a number of vendors are now adver-tising backplane speeds of .5G to 1G bit/sec., the capacity of this design far ex-ceeds technologies such as FDDI rings. The design does result in a bit of a single point of failure, though. ■

Scott Bradner is director of the Har-vard University Network Device Test-ing Laboratory.

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Attachmate's Extra grabs top spot in LAN/SNA gateway satisfaction

By Kevin Burden

Extra from Attachmate Corp., the smallest of the four vendors competing for the top spot in the local-area network/Systems Network Architecture (SNA) gateway market, squeaked by its competition to win our Buyers' Satisfaction Scorecard.

This is the second time Extra took the top spot. The last time we rated SNA gateways (Jan. 28, 1991), the product also slipped by the other vendors, beating Digital Communications Associates, Inc.'s IrmaLAN by just one point.

Extra has increased its shipments in the last several years, from 2,100 in 1990 to 2,700 in 1992, according to Framingham, Mass.-based International Data Corp.

Eicon Technology Corp.'s SNA Gateway finished a close second in overall user satisfaction with a score of 72, while also enjoying a second-place ranking in U.S. market share right behind Novell, Inc.

Desktop-to-mainframe gateways

PERCENT OF 1992 U.S. INSTALLED BASE
(TOP 4 VENDORS)

- 34% Novell
- 31% Eicon
- 21% Digital Communications
- 17% Attachmate

TOTAL INSTALLATION (4 VENDORS): 56,050
TOTAL INSTALLATIONS (ALL VENDORS): 108,791

Positioning itself as a solutions provider for wide-area networks, Eicon's success is impressive because unlike Novell, it continues to achieve double-digit growth without the strong network operating system sales to pave the way.

IrmaLAN achieved an overall score of 70, two points behind Eicon. The company had a comeback year in 1992: it shipped 3,300 gateways, up from 2,000 in 1991, which was a 15% decline from 1990.

Digital Communications Associates also added to its gateway arsenal by purchasing Computer

Logics this year. Novell's NetWare for Systems Application Architecture (SAA) gateway came in five points behind Eicon, with a score of 69.

Because gateway sales are so closely integrated with the sale of network operating systems, Novell has maintained a clear advantage in this market in terms of market share. Last year, the company shipped close to 9 million nodes of NetWare 3.X and 2.X — more than 10 times that of any other network operating system vendor.

Novell sold its previous gateway to Microdyne Corp. at the beginning of 1992, which allowed it to focus more on NetWare for SAA. Novell was also been able to take advantage of IBM's sales channels, which have accounted for more than half the sales of NetWare for SAA.

METHODOLOGY

User names were obtained from surveydor sources. First Market Research Corp., an independent market research company in Austin, Texas, conducted the survey and tabulated the results. The response base was 98.

Users rated their satisfaction with their installed products in 16 different categories and were not asked to compare or rate one product directly against another in the Scorecard. All categories were factored into the final scores.

To compute the overall score for each product, we performed the following steps:

1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score.

2) Repeat the process for all remaining categories.

3) Average the resulting figures for the average weighted score.

4) Convert the average weighted score to base 100; the ratio of the average weighted score to the average user importance is equal to the ratio of the overall score to 10. Numbers were rounded off where necessary.

ACKNOWLEDGMENTS

Computerworld thanks the following for their assistance in preparing this Buyers' Scorecard: Computerworld Database Division; Nancy Meachim, International Data Corp.

Attachmate's Extra 3270 Gateway Option

SCORE **74**

RESPONSE BASE: 50 USERS

8.6	
8.0	
8.0	
7.8	
7.8	Quality of technical support
7.5	Ease of use
7.4	

RATINGS BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

LIKELY **44** REASON: Dependable, connectivity compatibility

6 REASON: Limited functionality

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

Eicon's SNA Gateway

SCORE **72**

RESPONSE BASE: 28 USERS

7.9	
7.9	
7.8	
7.2	
6.9	Ease of use
6.6	Responsiveness of technical support

RATINGS BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

LIKELY **18** REASON: Good price, reliable

10 REASON: Too slow

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

Digital Communications Associates' IrmaLAN

SCORE **70**

RESPONSE BASE: 50 USERS

8.1	
7.6	
7.4	
7.0	
6.9	Quality of technical support
6.8	

RATINGS BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

LIKELY **40** REASON: Easy to use, flexibility

6 REASON: Poor memory management

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

Novell's NetWare for SAA

SCORE **69**

RESPONSE BASE: 50 USERS

8.1	
7.6	
7.4	
7.4	
7.3	Quality of technical support
6.8	

RATINGS BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Would you buy the program again?

LIKELY **42** REASON: Flexibility, compatibility

7 REASON: Too complex, difficult to use

DON'T KNOW **2**

REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS.

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branches without

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CISCO SYSTEMS

Cisco Systems' 7000:
Users give router high marks for installation, protocol support

Cisco Systems' Cisco 7000

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

■ Cisco Systems, Inc.'s Cisco 7000 internetworking router was praised by evaluators for its ease of use, multiprotocol support and fault-tolerant features.

■ The evaluators also said the performance and pricing were in line with expectations.

If the late 1980s were the years of the local-area network, the 1990s will surely be the decade of the internetwork. Why? Companies that are long past the stage of connecting PCs and workstations now want seamless networks that span the continent and the globe.

One company that has aided in that effort is Cisco Systems, Inc. in Menlo Park, Calif. A dominant supplier of internetworking routers, it announced its high-end Cisco 7000 in January.

At its unveiling, the Cisco 7000 caused a stir among analysts and users. Competitors Wellfleet Communications, Inc. and Coral Network Corp. had been releasing fault-tolerant routers with better throughput and larger capacities.

The Cisco 7000 came out with competitive features. Specifically, it boosted performance about 50% above previous Cisco routers, according to Cisco benchmarks. Fault tolerance is delivered through redundant power supplies and a "hot swap" feature that allows users to replace failed components while the router is on-line and operational. Capacity was boosted with five card slots that can support a variety of connections including 30 Ethernets, five Fiber Distributed Data Interface rings, 20 Token Rings, 40 wide-area network serial ports or a combination of those alternatives.

Evaluators for this Firing Line include technical staff members at a major health care provider, a public utility company, a computer services firm and a large regional bank. All have been working with the Cisco 7000 for a period of one to six months. All evaluators had also considered the IBM 6611 router in competitive evaluations with the Cisco 7000. Collectively, the evaluators oversaw 17 Cisco 7000 routers at an average cost of about $70,000 for each unit, including service, support and spare parts.

The format for this evaluation was prepared with help from Howard Rubin Associates and Technology Investment Strategies Corp.

Ease of use

The evaluators said the Cisco 7000 presented few problems in terms of day-to-day use, including adding or removing hardware components. They said the design of the chassis made it easy to swap components in and out of the router.

Health care: "It's very easy to view the status of network components and very easy to work with."

Computer services: "I was happy with the upward compatibility [of other Cisco routers] to the 7000. We didn't have to learn anything new."

Ease of installation

Average installation time was about one hour per unit, all the evaluators said. The utility evaluator expressed misgivings about installing the unit in a standard network rack but was assured by Cisco representatives that his concerns would be addressed.

Health care: "This was the first time we've installed a high-end router. The instructions were clear. It took about one hour to physically install."

Bank: "It was easy to handle, the instructions were complete, and [installation] took about one hour per box."

Configuration

The evaluators said the Cisco 7000 was about as easy to configure as earlier Cisco routers. They mentioned the command-line syntax required to program the router and said they thought configuration would be eased with a menu-driven or graphical interface.

Computer services: "We replaced five routers with one Cisco router and were able to do so on the first shot. It was very easy."

Bank: "Compared to Wellfleet [routers], it was more difficult [to configure]. It's not menu-driven, so you have to look in the manuals,

and you're not sure what options you have."

Reliability

The evaluators noted few reliability problems beyond the norm. Most failures were attributed to individual networks rather than the Cisco 7000. The leading evaluator had tested reliability by hot-swapping cards but had not experienced any operational failures.

Utility: "[Reliability] improvements are the redundant power supplies and the hot-swappability of modules."

Computer services: "Fault tolerance of the 7000 seems to be better than some [competitive] systems. You have more cards and redundancy."

Performance

Performance, according to the evaluators, was in line with their

Installation descriptions for users who evaluated the Cisco 7000

	Health care	Public utility	Computer services	Banking
Cisco routers installed	2	4	1	10
Installed since	FEBRUARY 1993	JULY 1993	JULY 1993	JUNE 1993
LANs supported	ETHERNET, TOKEN RING	ETHERNET, TOKEN RING	ETHERNET, TOKEN RING	TOKEN RING, SERIAL
Protocols used	IPX, APPLETALK, TCP/IP	BANYAN VINES, TCP/IP, SNA	TCP/IP	IPX, NetBIOS, TCP/IP
WANs supported	FRAME RELAY	FRAME RELAY (PLANNED)	T1, FDDI (PLANNED)	FRAME RELAY, SERIAL 56K, T1

Cisco Systems' Cisco 7000
Internetwork Router

Ratings are based on user expectations on a 1-to-5 scale, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users.

Overall rating	3.9
Ease of use	4.0
Installation	4.1
Configuration	3.5
Reliability	4.1
Performance	4.0
Bandwidth management	3.7
LAN support	4.5
Protocol support	4.3
Scalability	3.8
Technical support	4.7
Cost	3.4
Value	3.7
Enhancements	3.8

Evaluators neutral on cost,
performance; say software could use upgrade

expectations. However, none had pushed the unit to its threshold, with the banking and health-care evaluators saying they had not exceeded 20% and 50% of capacity, respectively.

Utility: "We're not pushing the parameters of the box right now, but we expect it to perform well."

Computer services: "We expected it to replace five routers, and it performed very well."

Bank: "We're not even at 20% of [the router's] capacity."

Bandwidth management

None of the evaluators made extensive use of the Cisco 7000's bandwidth management features, although they agreed documented specifications seemed to fulfill their needs.

Health care: "We noticed that the base scripting and management capabilities can be awkward at times, although they are comprehensive."

Bank: "The 7000 gives you a lot of options to control traffic. On Novell [NetWare], we're able to block some services."

LAN support

The health care evaluator noticed better network analysis in the Cisco 7000, including the ability to copy network packets to a separate analysis buffer. The computer services evaluator said many functions of LAN analyzers could be integrated into internetworking routers such as the Cisco 7000.

Utility: "They support everything we need to do and beyond."

Computer services: "It is comparable with other products, but I'd expect more features to monitor a LAN."

Protocol support

Protocol support may be one of the most vexing issues in the networking industry. Router vendors must support a wide range of de facto standard protocols, as well as variations in protocol implementation.

The evaluators gave the Cisco 7000 router high marks for protocol support, saying that protocol problems had been promptly been addressed and fixed by Cisco engineers.

Health care: "There has been a problem with some protocols, but Cisco came up with a fix in five or six days."

Utility: "They support every protocol we have ever wanted to support, although there have been intermittent problems with each of them."

Computer services: "It's not error-free, but this is the heart of the router, and Cisco has really put a lot of effort into debugging some of these protocol issues."

Scalability

The evaluators said Cisco's stated product plans were their primary gauge of scalability. They concurred that the key issue was compatibility with the current product line and that they had no preference for a particular architecture.

Health care: "Our needs will be increasing

Facts about the Cisco 7000

■ **Dual redundant power supplies.**

■ **Hot swap of components while router is in use.**

■ **Configured price approximately $70,000.**

Cisco Systems, Inc.
1525 O'Brien Drive
Menlo Park, Calif. 94026
(415) 326-1941

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quickly over the next eight to 12 months, so their migration path for the Cisco and the switch processor is important."

Utility: "They talk about scalability in their future products, but only time will tell."

Computer services: "We're nervous about the compatibility of the existing system."

Technical support

With a range of support contracts, the evaluators agreed that Cisco's technical and engineering support was superlative. Two of the evaluators said they use third-party technical support services because of concerns about on-site support in far-flung or remote offices.

Utility: "Their tech support is excellent. The people are knowledgeable, and it's definitely one of their high strengths."

Computer services: "The thing they do best is tech support."

Costs

Evaluators said the costs of Cisco 7000 routers, service and parts were in line with their expectations. The evaluators spent approximately $70,000 on average per installed unit.

Utility: "If you staff the chassis with [network] cards, the cost per port comes down and becomes very economical. It also depends on your network design, which can bring down costs."

Computer services: "In our environment, we replaced five boxes with one [Cisco 7000], so it was cost-effective."

Value

The evaluators rated overall value slightly better than the cost per unit.

Health care: "We've gotten what we paid for."

Bank: "It provides the internetworking we need for our applications and our site."

Enhancements

The evaluators concurred that the hot-swap cards and redundant power supplies were the best enhancements to the Cisco 7000. Future enhancements include better bandwidth management, gateways to IBM host systems and Asynchronous Transfer Mode (ATM) interfaces.

Utility: "There are still some features we'd like to see, like better hot-swappability. But the design is excellent. The next thing we're waiting for is ATM."

Computer services: "It's not a different box [than the AGS+], other than size and redundancy. We wanted something [to replace the AGS+ line] that was bigger, compatible and wouldn't go down."

Bank: "Fault tolerance was the most important."

Cisco responds

Cisco officials provided these responses to issues raised in this evaluation.

■ **Scalability:** Cisco intends to maintain compatibility and upward scalability in future iterations of our high-end line of routers through software compatibility, architectural design that anticipates and supports interfaces to accommodate new technologies and adherence to industry standards. The Cisco 7000 was designed to serve as the foundation for tomorrow's high-performance technologies, including silicon packet-switching and ATM technology.

By the end of next year, the Cisco 7000, while remaining fully software-compatible with existing Cisco platforms, will double its performance on all media through the use of silicon-switching technology and will support such advanced interfaces as ISDN Primary Rate, 100 channel and channelized T1. The architecture also allows for future performance upgrades.

■ **Architecture:** In order to protect the investments of our installed base of customers, Cisco will continue to offer the product architectures and solutions that meet customer demand for scalable performance with its cards-to-"fork-lift" upgrades.

The Cisco 7000 has a very powerful architecture that handles all LAN/WAN connections easily. For example, a heavily loaded Ethernet plugged into a Cisco 7000 today consumes about 1% of the router processing power of the box. Additionally, unlike some parallel-backplane architectures, the Cisco 7000 is not constrained by its interfaces. The proof is that Cisco is well along in the development of a 155M bit/sec. (bidirectional) ATM interface.

■ **Future enhancements:** To address the high-speed, distributed backbone network architectures of the near future, the Cisco 7000 will be enhanced with silicon switching, a multiple channel interface processor, an IBM channel-attach interface and ISDN Primary Rate interface; an ATM interface; and support for routing clusters that can act as high-speed silicon cell switches.

Let BENCHMARKS Help You Select the Right Windows NT System for Your Business ★

With its potential to span the operating system environment from personal to departmental to mainframe is concerned, Microsoft's Windows NT enables you to take advantage of the best microprocessor technology available, such as Digital's AXP processors — dubbed by *PC Week* as the "dream machines of the Windows NT world."

In deciding on a Windows NT system, you must first understand how this system will fit into your business — as a PC, as a workstation, or as a server. With an increasing number of vendors to choose from, the actual selection of a particular Windows NT system may prove difficult. Benchmarks will help.

A Word of Advice About Choosing Windows NT Benchmarks

Benchmarks measure everything from CPU to memory to I/O subsystems, and more. As a general rule, you should always pick benchmarks that most closely resemble your particular application environment. That way you'll avoid the surprise — not in the performance but in the cost — of a system that isn't up to your specific business requirements.

When comparing benchmarks from different vendors, be sure to acquire information that gives you the closest comparison. For example, it's not a good idea to compare TPC-A numbers from one vendor with SPEC numbers from another. The particular benchmarks you're comparing and contrasting should be the same across the board — no matter how many vendors you're looking at. In addition, make sure to use the same version of each benchmark.

For Windows NT specifically, be sure to use benchmarks that are paired native to Windows NT. Native benchmarks are written to Windows NT's Win32 API (Application Programmer's Interface) and provide truer performance numbers than non-native benchmarks.

Here's a benchmark listing to assist you in selecting the best Windows NT system for your business.

PC Benchmarks for Windows NT

Hellzone
(Windows Magazine)
Hellzone offers a good system level comparison of native Windows NT platforms. It measures integer performance (Dhrystones per second), floating-point performance (KiloWhetstones per second), disk performance (kbytes per second), and video performance (megapixels per second).

Ziff-Davis
The Ziff-Davis benchmark is made up of three different tests. The processor test, measured in cycles per second, executes a mixture of operations. It does not exercise floating-point math capabilities, but it is designed to exceed the limits of the onboard processor cache, so as to test the secondary cache subsystem and cache-to-memory interface.

The graphics test, measured in mega-pixels per second, executes typical Windows functions such as drawing lines, drawing polygons, and rendering fonts on the screen.

The disk test, measured in kilobytes per second, measures the aggregate speed of the processor, hard disk, and intervening cache/controller subsystems in transferring data to and from mass storage.

Decide how your Windows NT system will be used. Will it run PC spreadsheet applications? Workstation CAD applications? Or will it serve as a server? As the operating system of the future, Windows NT can do the work of all three. Then, choose the benchmarks that allow you to best evaluate your business processing environment.

Workstation Benchmarks for Windows NT

Mandelbrot
This benchmark uses Mandelbrot set generation and display to determine the double-precision, floating-point speed rating of a system. The Mandelbrot test can be used as a computer performance benchmark by measuring the rate at which double-precision floating-point computations are performed in generating the set. Such measurement leads to an application-specific measure of a system's speed. (Metric: Mandel/Snot)

CLINPACK
A linear equation solver written in C, CLINPACK programs consist of floating-point addition and multiplications of matrices. 100 X 300 and 100 X 100 matrix of simultaneous linear equations. Source code changes are not allowed so that the results may be used to evaluate the compiler's ability to optimize for the target system. (Metric: execution rate measured in MFLOPS)

X11perf
X11perf tests various aspects of X server performance including simple 2D graphics, window management functions, and X-specific operations. This benchmark employs an accurate client/server synchronization technique to measure completion times of graphics operations. X11perf tests primitive drawing speeds of graphics and window environment manipulation. (Metrics: 2D kilovectors/second drawing rate, 2D megapixels/second fill rate)

PLB
PLB (Picture-Level Benchmark) allows comparisons to be made of graphics display performance for different hardware platforms. It contains six applications: a typical 2D electrical CAD application, a 3D wire frame model of a computer chassis, a 3D solid model of an automobile engine cylinder head, a 3D model of a human head created using data generated by a laser scanner, an example of a low-end 3D simulation, and an architecture walkthrough of an artist's studio consisting of 300 frames. Each benchmark generates two GPCmarks, the PLBlit (literal) and the PLBopt (optimized).

SPEC CINT92 and CFP92 (Standard Performance Evaluation Corporation)
CINT92, the integer suite, contains six real-world benchmarks written in C. The suite represents application areas including circuit theory, LISP interpreter, logic design, data compression, spreadsheet, and software development. SPECint92 — the geometric mean of the suite's four SPECratios — is a good base indicator of CPU performance in a commercial environment.

CFP92 consists of 14 real-world applications; 2 are written in C and the remaining 12 in FORTRAN. This suite of benchmarks represents application areas such as circuit design, quantum chemistry, optics, robotics, quantum physics, weather prediction, and others. SPECfp92 — the geometric mean of the suite's 14 SPECratios — may be used to compare floating-point computer performance.

Dhrystone
This benchmark measures integer processor and C, Ada, or Turbo Pascal compiler efficiency. Dhrystone is representative of systems

programming environments and contains many procedure calls. (Metric: Dhrystone Millions of Instructions per Second [DMIPS])

Server benchmarks for Windows NT
TPC-A
This benchmark measures CPU, memory, I/O subsystem, terminal handling, and database performance. TPC-A is an online transaction-processing benchmark and is database dependent. Some vendors use client/server or front-end/back-end configurations. (Metrics: tpsA-Local and $/tpsA-Local)

TPC-C
TPC-C exercises a breadth of system components associated with online transaction processing (OLTP) environments. The workload is a mixture of read-only and update-intensive transactions that simulate the complex activities present in many OLTP application environments. Five transactions are used to model the business activity, and each transaction is subject to a response-time constraint. (Metrics: tpm-C, i.e., number of orders processed per minute, and price-per-tpm-C)

NETbench (Ziff-Davis Labs)
NETbench consists of three benchmarks that focus on CPU throughput with the metric in transactions per second, Network Interface Card (NIC) throughput in bits per second, and IO throughput in bits per second.

In Store for the Future: Tomorrow's Windows NT benchmarks
Look for the following benchmarks to be ported to Windows NT in the near future.

BAPco
BAPco — a consortium of PC manufacturers and PC software vendors — created an applications-based benchmark to demonstrate realistic application performance. Its first benchmark, SysMark92, was introduced in 1992 and contains eleven real applications, eight DOS-based, and three Windows-based applications in six categories. With the SysMark92 suite, you're provided with actual applications-based benchmarks in the areas of word processing, spreadsheet, database, desktop graphics, desktop publishing, and software development.

Khornerstone
Developed by Workstation Laboratories, the Khornerstone benchmark contains 21 separate tests that run the overall performance of a system. The tests include both public domain, e.g., Whetstone, Dhrystone, Sieve, etc., and proprietary routines. Khornerstone measures single-user loads on a system and provides

one number to represent that load condition. (Metric: Total Khornerstones)

Ghraphstone
The Ghraphstone tests — 125 tests in all — draw a variety of different graphics shapes and sizes and measure the operations per second that graphics hardware can support. The tests are written in C and have been ported to a number of different graphics libraries such as X11, Microsoft GL, SiliconGraphics, CGI, CORE, and GKS. Currently, these tests run on MS-DOS and UNIX. (Metrics: operations per second for each drawing function; a summary performance number for each of 13 different figure types; a summary Ghraphstone rating indicating overall graphics performance)

For information on Windows NT performance benchmarks or benchmarks on Digital's AXP-, Intel-, MIPS-, or VLX-powered processors, write to the following Internet address:

cngperf@smhcs.enet.dec.com

★ ★

Begin 21st Century Application Development Today — With PowerHouse and Alpha AXP

If you're looking for the fast route to the future of application development, the search is over. Cognos, Inc. is now shipping its PowerHouse 4GL application on Digital's Alpha AXP platform.

It's the first 4GL with native-mode availability to ship on Alpha AXP and OpenVMS systems. In short, the most widely used 4GL in the Digital marketplace is now better than ever — running on the world's fastest microprocessor.

"Our Alpha AXP strategy is part of the Cognos commitment to provide powerful solutions to Digital users and our VARs who have written applications in PowerHouse," says Ron Zambonini, President and COO of Cognos, Inc. "This commitment has made us one of Digital's largest COSESION solution providers. We're also fully committed to support Digital's strategic direction with Alpha AXP, DEC OSF/1, and Windows NT platforms."

Whether you choose to move to the Alpha AXP platform today or tomorrow, change all your systems or just a few, the flexibility and compatibility of PowerHouse can help you succeed.

"We went the extra mile, ensuring that PowerHouse applications are completely binary compatible between VAX systems and Alpha AXP systems," Zambonini explains. "Customers can build applications on the VAX system today and run them on an Alpha AXP system later. Or, they can use the power and speed of Alpha AXP systems to develop applications of the future right now."

Cognos/Digital Solutions Get Rave Reviews from Customers
PowerHouse applications have already been ported to the Alpha AXP platform — with positive results for Cognos' value-added resellers and customers alike.

"Digital and Cognos make it possible for us to take advantage of the latest in technology without changing a single line of code," says Brian Deppeine, Vice President of Technology, StarGarden Corporation. "For us, the move to OpenVMS on Alpha AXP was very simple."

Lou Anne Strickland, VAS Software President, explains that "with PowerHouse on Alpha AXP, we can now offer our customers VAS financial packages running on a very powerful alternative with the Digital family."

For the Marketview Company, the porting of its MarketviewPlus marketing and sales automation system was completed with ease. "The process couldn't have been more straightforward thanks to Cognos and Digital," says company President Edward Lucia. "This opens up a new market for our PowerHouse-based software and less Marketview get in on the ground floor."

For information on PowerHouse, the StarGarden Human Resources Information System, VAS Software financial packages, or the MarketviewPlus marketing and sales automation system, call 800-4COGNOS (800-426-6667), ext. 8L. ■

Working on the Brain Gang

Most advanced technology chiefs say the think-tank mentality is dead. The heat is on to make advanced tech work relevant to the business.

MEET THE BRAIN GANG

On the next few pages, the following group of advanced technology men share their views on planning for implementation and integration of new technologies.

MARK BARMANN
CIO
Charles Schwab & Co.
SAN FRANCISCO

JOHN DYNKOWSKI
MANAGER,
Emerging Technology
Midwest Securities
Trust Co.
CHICAGO

DAVID ECKERT
MEMBER,
Advanced Technology and
Architecture Group
Westinghouse
Savanna River
AIKEN, S.C.

BRUCE FOLGER
DIRECTOR,
Advanced Technology and
Resource Management
Variable Annuity
Life Insurance Co.
HOUSTON

GEORGE KENNEY
EXECUTIVE DIRECTOR
Swiss Bank Corp.
CHICAGO

KENNETH TIVEN
VICE PRESIDENT,
Television Systems
Turner Broadcasting, Inc./
CNN
ATLANTA

By Ellis Booker

Blue-sky technologists at end-user companies are an increasingly rare breed. These days, free thinkers unconcerned with the bottom line or the relationship between technology and explicit business goals have become a luxury few can afford.

On the other hand, as companies of all sizes race toward distributed environments — open architectures in which, typically, no one vendor dominates — corporate technologists have to work overtime watching the horizon for new software or new and untried companies.

Organizationally, while many information systems shops continue to designate a small group to perform this function, others have tried to distribute responsibility for "advanced technology" throughout the ranks. As one executive who promotes this sort of structure puts it: "We don't want to create two classes — one working on the new, the other with its finger in the dike of the old."

As complex as finding and selecting new technology can be, it often pales in comparison to the task of deploying it. One valuable approach is to make end-user departments part of the process of technology assessment. This has the same benefit as involving users in application development: It spreads responsibility and helps avoid a mismatch between what the users need and what IS ultimately delivers.

The following interviews with those involved in advanced technology touch on many points. But the most valuable advice may be the tips on how to avoid dead ends, headaches and heartaches.

Tips on how to plan, deploy

Plan it

CITICO BANK

When it comes to advanced technology, "the CIO has to figure out which strategy the company is pursuing and then pick technologies," says George Kenney, executive director in charge of globalization of technology within the 200-person IS operation at Swiss Bank's U.S. headquarters in Chicago. Swiss Bank's business strategy is defined by product innovation, with object-oriented programming used to get it there.

"If product innovation is your goal, you want to be able to turn on a dime. One key technology for this is software reusability," says Kenney, who has standardized around Objective C.

VARIABLE ANNUITY

Bruce Folger, director of advanced technology and resource management at Variable Annuity Life Insurance in Houston, says his research projects don't get undertaken unless some business-related project has been articulated first. In fact, the company does not allocate funds to research as a percentage of the IS budget. "Spending could be 3% this year, 10% next," Folger explains. "In a sense we're tying research to the business plan."

WESTINGHOUSE SAVANNAH RIVER

David Eckert, member of the 10-person advanced technology and architecture group at Westinghouse Savanna, says his group must balance its initiatives between an investigation of far-out technologies (those that could have an impact five-plus years away) and ones promising short-term benefits.

► CIO's Kenneth Tven *wants technology that delivers a 'warp leap'*

TOWER BROADCAST'S CIO

Kenneth Tiven, vice president of television systems, points out that when CNN considers new technologies, it desires "a warp leap, not a little leap." In other words, he says, tried-and-true systems will not be overhauled unless the benefits are large.

MIDWEST SECURITIES TRUST

At Midwest Securities, a broker clearinghouse in Chicago, an exclusively business-driven approach to new technologies is the rule. "The reason for no ['blue sky' organization] is cost justification," says John Dynkowski, manager of emerging technology in the 40-person IS shop.

Test it

CHARLES SCHWAB

At Charles Schwab, one promising approach to appraising advanced technology requirements and involving end-user departments early on has been the creation of 14 conceptual applications, known as Paths.

The idea is to figure out what the company needs functionally and match a technology to that. For example, mutual funds order processing is an easily identifiable application related to a business initiative.

Late last year, business unit executive vice presidents were named owners of the Paths and were vested with responsibility for deciding both the deployment of resources and the sequence of Path projects.

"We're breaking up our system, which is intensely mainframe-based, into thousands of little computers," Chief Information Officer Mark Barmann says. For this to work, workstations, not PCs, were the platform for the desktop.

► Midwest Securities' John Dynkowski *says to involve users*

Sell it

TOWER BROADCASTING

"You need to assume most people will have less confidence in the desirability of new technology," Tiven says. So-called early adopters will support the change, and another 20% at the bottom will never like the disruption and may even pine for the system that was in place two generations ago. "It's the 60% in the middle that you go after: The war is won if you [sell] 51% percent of those people in the middle," he says.

MIDWEST SECURITIES TRUST

One way to sell a new technology is to build prototypes using loaner hardware and software from a vendor, says Dynkowski, manager of emerging technology. "You need to make users a key part of the development process," he says, adding that only these users can tell "how big, how fast and how scalable" the new system has to be.

Deploy it

CHARLES SCHWAB

Deploying technology becomes easier if the IS group as a whole is knowledgeable about the new technology. When it begins installing the first pieces of an ambitious distributed computing architecture this fall, Charles Schwab's 465-person IS group plans on having advanced technology know-how throughout its ranks, according to Barmann.

Barmann says he wants to put advanced technology personnel side by side with the applications development, telecommunications and operations groups he has today. "We don't want to create two classes — one working on the new, the other with its finger in the dike of the old."

WESTINGHOUSE SAVANNAH RIVER

"It's extremely important to consider training and the help desk as part of the whole [technology deployment] process," Eckert says.

Users should not need vast amounts of training to do their jobs, Eckert argues. New technologies ought to be "appliances," the workings of which are largely transparent to them, he says.

TOWER BROADCASTING'S CIO

Tiven assumes new technology deployment is always disruptive, so promised benefits must outweigh this.

---

and integrate advanced tech

Merge it

VARIABLE ANNUITY

Looking for easier ways to integrate a number of off-the-shelf products is a short-term project for Folger.

Specifically, he wants a way to wrap Notes, an application generator, an imaging system from FileNet Corp. and several other tools into a customer-file application.

"We're trying to implement this before the end of this year," says Folger, who is part of a 200-person IS team.

Longer term, Folger wants a way to mix operating systems on a network, which will let him focus on finding the best applications for different jobs, regardless of what underlying operating platform they may use in the work process.

> Swiss Bank's George Kenney bets on standards

"The two issues for us are storage and then the question of content — what consumers will want to interact with and pay for," Then says.

★ **CHARLES RICHARD:** Distributed computing O&M tools that produce and scale data from mainframes, servers and clients.

Schwab's IS division will replace the company's IBM 3270-type environment with a three-tiered architecture, downplaying its Hitachi Data Systems Corp. mainframes and putting in hundreds of reduced instruction set computing-based Unix servers and potentially thousands of Unix workstations, according to CIO Mark Barmann.

"The distributed computing architecture allows a whole set of things to happen across that network," he says, adding that he expects this infrastructure will spawn new ideas about technology and applications.

★ **WESTINGHOUSE SAVANNA RIVER:** Client/server and networking technologies for multimedia and videoconferencing applications.

The plan at Westinghouse Savanna River is to have client/server and networking technologies seamlessly link the 25,000 workers and 15,000 PCs with the mainframes, minicomputers and supercomputers on the site's 30-mile-wide campus in Aiken, S.C.

Already the company has installed some Fiber Distributed Data Interface backbone networks between buildings; the technology group is currently evaluating ways of upgrading its 10Base-T Ethernet LANs. This network migration anticipates multimedia and multiperson desktop videoconferencing applications.

The group is also focusing on how to handle licensing, software distribution and systems management for a client/server architecture.

★ **MIDWEST SECURITIES TRUST:** Client/server.

The company is developing client/server applications under Ethernet, Unix and an Informix Software, Inc. relational database management system.

"We're trying to define a single system appearance to run across Windows or Motif for any variation of Unix," says John Dynkowski, manager of emerging technology. Dynkowski is especially bullish on the next generation of Informix's RDBMS, with its added disk mirroring and simultaneous writing to tape for backup.

Unify it

SWISS BANK

Like several other advanced technology planners, Kenney is betting on standards as a way of freeing his department from spending time investing mundane things.

"It's even conceivable we'll be buying standard applications and packaging them together," he says.

"You don't want to spend precious [information technology] resources. . . . You want to outsource as much as you can," he adds.

The caveat to this advice is that suppliers of new technologies must be picked in a very careful manner. Kenney recommends reducing the number of technology suppliers to eliminate any hassles.

"Too many management cycles and so much management bandwidth," he says.

CHARLES SCHWAB

Charles Schwab's distributed computing initiative includes support for open standards such as the Open Software Foundation's Distributed Computing Environment and Distributed Management Environment.

Barmann says the world of advanced technology and standards has meant a change for Schwab. The company — once upon a time a dependable IBM account — has had to work with vendor companies that are small and young.

"There are a lot of new [technology] entrants . . . and we're dealing with much smaller companies with much more limited resources," he says.

In these cases, he explains, Schwab becomes "part venture capitalist, part bank and part customer."

VARIABLE ANNUITY

Taking a cautious view on standards, Variable's relatively young technology group — it was formed 10 years ago — made a deliberate decision to install best-of-breed applications rather than hold to a set of technical standards. While this approach creates more support issues for the IS organization, it gives Variable a great deal of flexibility, Folger says.

> Charles Schwab's Mark Barmann has had to rely on unskilled vendors

All interviews compiled by Ellis Booker, senior editor, advanced technology.

THE HOT ONES

Here are the advanced technologies our chiefs are pursuing:

★ **SWISS BANK:** Enhanced functionality for automated teller machines, interactive cable television and wireless data systems.

"I don't know if all three of these horses will come in, but I think one or two will," IS chief George Kenney says.

★ **CNE:** Nonlinear storage media.

"Everything we do now is on linear media," explains Kenneth Tiven, vice president of television systems. Tiven says he is looking forward to being able to store and manipulate images, audio and text on a single system.

Just as important, such a "unitary" storage architecture — with capacities in the terabyte and beyond range — will have an enormous impact on the cable news company's internal operations, promising speed and reduced costs and complexity.

Unfortunately, what's available today isn't up to the task of, say, broadcast-quality video, which has 50K bits of information per frame and 30 frames per second.

Teach yourself RPG III

By Alice Bredin

RICH PAGNI HAD NEVER seen an IBM Application System/400 when he decided to learn RPG III. But one month and many hours later, he landed a job as a technical consultant in the AS/400 market.

Pagni had spent 19 years programming in RPG II on an IBM System/36. When he lost his job, he saw little chance of getting a similar position. His plan was to convince a company to let him train in the AS/400 without asking for a job. He propositioned approximately 20 firms, and New Resources Corp., a Schaumburg, Ill., AS/400 information management services firm, took him up on his offer.

For the next nine days Pagni listened to audio tape tutorials on the commands and logic of the AS/400 and RPG III and worked on the equipment at New Resources. He studied about 11 hours every day.

Pagni's first step was getting used to RPG III's top-down programming, which requires that code be written in sequence. He says his automatic response was to write code and go back and forth between the different lines to change it, like he did for RPG II.

One of the more difficult concepts to learn was that of relational databases, as opposed to the flat organization of the System/36. He also had to learn how to organize data when programming. "With the System/36, you have a file, and that's

it," he says. "With the AS/400, a file of information can be organized in 15 different ways in addition to the original way it was constructed."

To use the relational database, Pagni learned Data Description Specifications. He taught himself to use a reference file, which contains keywords for recalling fields with defined parameters. He also familiarized himself with AS/400 functions such as "query," which selects records based on specific criteria.

Giant leap

The biggest technical hurdle was learning about subtle programming—creating a file that allows a user to scroll forward and backward. When he programmed for the System/36, he changed one record at a time. Now when he makes an application, he makes more decisions about what options to offer users. "I can program it so they see the next 18 files or the next 50 files. It's just more decisions and more logical problems to solve," he says.

The AS/400's elaborate Help function, which prompts you when necessary, was useful. "If you want to know if there is a start command, you can scroll through the verb list until you find it," he says.

Looking back, Pagni says the undertaking was difficult, but it has been worthwhile. He makes about 10% more than he did in his last job. "And I'm still learning," he says.

Bredin is a free-lance writer in New York.

The network news

By Joseph Lazzaro

If you're a network administrator migrating to a new network operating system, there's little to worry about. Once you understand the basic concepts of one, experts say, it's relatively easy to learn the others.

"The terminology used among different networks is different, but the functionality is more similar than the major players care to admit," says Jeff Sloman, vice president of Systems Integration, Inc. in Indianapolis.

Networks perform the same basic function: sharing files, printers and other resources among users and groups of users, irrespective of the brand name on the box. If you're planning to learn the ins and outs of one that you're not used to, you'll want to know the basics and maybe check out a few classes.

Novell, Inc.'s NetWare

NetWare supports file systems ranging from MS-DOS, OS/2 and Macintosh to the NFS network file systems found on many Unix machines. It generally uses a text-based interface but also supports Windows. Versions of NetWare can support small peer-to-peer networks using NetWare Lite, while you can create larger networks using NetWare 3.X and 4.X.

Microsoft Corp.'s LAN Manager

LAN Manager supports OS/2, Macintosh and Unix, which enables it to deal with a wide range of platforms. Microsoft's Windows NT Advanced Server, however, is expected to replace LAN Manager in Microsoft's product line in the near future. A solid knowledge of the Windows environment is mandatory for NT Advanced Server because of its graphical user interface. The system is on par with Net-Ware and is well-suited for medium-size networks.

IBM's LAN Server

LAN Server is an OS/2-based network operating system that supports DOS, Windows and OS/2 clients. It also performs peer-to-peer as well as client/server networking. In addition to standard network functions, LAN Server lets an OS/2 workstation share local resources with the rest of the network, allowing a local hard drive to be used by others on the network. Despite this arrangement, a workstation could share a printer, disk drive or other local resources with others on the network.

Banyan Systems, Inc.'s Vines

Knowledge of Unix is useful. However, if you are dealing with a preinstalled Vines setup, you can put off learning it for a while. After installation, Vines creates a shell that resembles MS-DOS; therefore, a concrete knowledge of DOS is also mandatory. If you know NetWare, you should have little trouble with Vines, unless you want to dive deep under the hood to the Unix core.

Artisoft, Inc.'s LANtastic

LANtastic in MS-DOS-based and well-suited for smaller networks. The network can be configured as either peer-to-peer or in a client/server mode. LANtastic supports MS-DOS, Windows, Macintosh, Unix and NetWare.

Lazzaro is director of the Adaptive Technology Program at the Massachusetts Commission for the Blind in Boston.

Training opportunities

Novell

Novell offers a multilevel training program covering network installation and system administration. This program consists of the following levels:

- **Certified Network Administrator:** Responsible for system administration from a software point of view with minimal training and responsibility for network issues.

- **Certified NetWare Engineer:** Focuses on both system hardware and software. Covers operating system installation, network expansion, wiring topology, troubleshooting and general administration.

- **Enterprise Certified NetWare Engineer:** Focuses on cross-platform networking across wide-area networks.

For more information call (800) 688-8273.

Banyan Systems

There are two basic ways to obtain Banyan training — from Banyan or from a Banyan certified education center. For an apprentice administrator, suggested courses include the following:

- **Vines Administration:** Focuses on how to set up, maintain and manage a typical network.

- **Problem-Solving for Vines Net-works:** Explains the fundamentals of Vines architecture, operations and basic problem-solving methodology.

Microsoft

Microsoft offers a series of courses focusing on LAN Manager, Windows NT Advanced Server and Windows for Workgroups.

These include Supporting Microsoft Windows NT, Network Administration for LAN Manager, Management of Advanced Services for Microsoft Windows NT and Supporting Microsoft Windows with Networks. Microsoft also offers video versions of certain classes.

For more information call (800) 227-4679.

IBM

IBM offers a series of courses through its Skill Dynamics centers on OS/2 LAN Server training. These courses can be conducted at IBM sites or on-site. Courses include OS/2 LAN Server Workshop and Integrating NetWare and OS/2 LAN Server.

For more information call (800) 426-8322.

Artisoft

LANtastic's courses are aimed at resellers that are responsible for training and supporting their end users. Courses offered include the following:

- **LANtastic for TCP/IP:** Details how to interface a LANtastic network to Unix hosts.

- **Planning and Installing the LANtastic Network Operating System:** Covers the central planning stages of a network.

For more information call (800) 233-5564.

The service industry continues to hire more workers than any other segment, while manufacturing continues to trim the fat

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*Source: U.S. Department of Labor, Bureau of Labor Statistics

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Lessons in the leasing game

By Timothy E. Duncan

Leasing or financing software is like going for a sail. You have to know where you're going and how you'll get there before you leave the dock. Unfortunately, most companies never learn to navigate the software leasing seas.

The word 'leasing' is really a misnomer when applied to software," says Doug Wetzel, founder of International Software Finance, a financing firm in Westport, Conn. "We generally speak of software financing to make clear that we are not dealing with a situation where title is being transferred to a lessor, as in hardware leasing."

Software financiers, unlike hardware lessors, do not take title to the property they finance because software vendors refuse to pass title. Instead, vendors grant a license to pass the software for a specific purpose and time period.

They also restrict a user from transferring the rights of the software to other parties, including lessors.

As a result, software financiers make their money on the user's payments, not on the value of the software at the end of the financing terms.

Who's at risk?

"Hardware lessors take asset residual risk. Software financiers generally do not," Wetzel says. "Because the license agreement limits the right to use the software to the original user, the software is of no use to anyone else at the

end of the lease term."

Even though its nature is different from hardware leasing, software financing is a valuable tool for a number of reasons.

• Users can often avoid dipping into their capital budgets to pay up-front software licensing fees. Lease payments, depending on the structure of the transaction, may be treated as an operating expense over the life of the lease term rather than a capital outlay.

• Companies can sometimes do a better job of matching expenses with benefits. According to Wetzel, software implementation takes an average of 25 months to reach full productivity, and most users dislike absorbing all licensing costs in the first year of a project. Software financing can spread out the cash and accounting expenses associated with acquiring software over the life of a project.

• Capital can be conserved initially by financing some of the additional costs associated with software acquisitions such as the installation, training and maintenance. These additional costs can be paid over the life of the financing term instead of on Day 1.

Duncan is an attorney and president of Denison Resources Group, a Boston advisory firm that assists companies with purchasing, leasing and financing high-tech equipment.

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CASE of arrested development

Computer-aided software engineering (CASE) stocks have been looking downtrodden of late.

Euphoric initial public offerings by client/server graphical user interface (GUI) application builders Powersoft Corp. (PWRS) and Gupta Corp. (GPTA) earlier in the year gave the appearance that older application development technologies might be swept aside completely. And CASE vendors contributed to their own grim prognosis: KnowledgeWare, Inc.'s (KNOW) restructuring led to a big loss in fiscal 1993, despite mild revenue growth, while Intersolv, Inc. (ISLI) surprised Wall Street by stumbling badly in its February quarter report, dropping its share price into the basement.

KnowledgeWare issues have hovered just over 10 recently, off a 52-week high of 16. Intersolv, after sinking under 5 in the past month, rebounded somewhat last week. When Intersolv reported quarterly results last week, the company notched a modest first-quarter profit of 5 cents a share, on $2.6 million, on declining revenue year-over-year. Intersolv's 52-week high was 15.

CASE providers have scrambled to reposition their front-end analysis tools to work with PowerBuilder and its ilk. Analysts disagreed on whether CASE stocks' current low valuations represent a buying opportunity or a stopover on a downward journey.

Curt Monash, president of Monash Information Services in New York, mentioned Intersolv as "the most undervalued stock in the industry," pointing to the 40%-plus growth rate of its PCVS configuration management product sales and the release of a new generation of Excelerator technology (see story page 20).

However, investors and other analysts have remained skeptical. "It's a wait-and-see situation," said Peter Schleider, an analyst at Wessels, Arnold & Henderson in Minneapolis. "If they really make 10 to 12 cents a share next quarter, maybe the stock lives."

Schleider said KnowledgeWare also has more to prove. "People are probably going to do some modeling when they use a GUI [GUI such as PowerBuilder], but there is never going to be that total buy-in with the structured analysis that KnowledgeWare's flagship CASE products provide, he said.

Actually, Powersoft and Gupta have lost some momentum on the stock market. Schleider said he expects the whole application development market to slow for a time while users try to sort through the confusion of multiple development methods and products.

— *Derek Slater*

Dell trying to get back on track

Dual strategy focuses on adding distribution channels, streamlining processes

By Michael Fitzgerald
AUSTIN, TEXAS

Having taken its lumps following several mismal missteps, Dell Computer Corp. last week softened the blow of a $75.7 million second-quarter loss with details about its future plans.

Threatened by the entry into the direct marketing channel of newly aggressive IBM PC Co. and Compaq Computer Corp. and slammed for its inability to track parts and inventory and its strategic blunders in the notebook industry, Dell executives said the company is ready to correct the mistakes that appear to have cost it dearly.

In recent interviews here, Dell executives cited two main courses of action the firm is taking to regain a strong bottom line:

• Diversify its direct-centric distribution.

• Effectively execute its new corporate infrastructure to avoid the problems it had handling its growth, particularly poor inventory management systems.

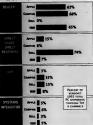Joel Kocher, Dell's president of sales, conceded, "We have to execute and the fourth quarter is key."

Results speak

Dell's various problems were resoundingly underscored by the $75.7 million loss on revenue of $700 million for its second fiscal quarter. While Dell had cautioned investors in advance, its second-quarter loss was slightly worse than expected, and revenue was also slightly lower than it had expected (CW, July 19). Revenue was up 53% over the year-earlier quarter and 4% over the first quarter of 1993.

The major factor in the loss was a $71 million restructuring charge Dell took to deal with such problems as a lack of inventory controls, which caused it to build too many systems, and its junked notebook project.

Sean Burke, an original member of the team that produced Pro-Lines at Compaq and now director of product marketing and planning at Dell, said it took Compaq until after its third-quarter loss in 1991 to see what its problems were. Dell, on the other hand, realized it had some problems and started to work on them before its recent loss.

Despite the loss, the stock market reacted positively by boosting Dell's stock slightly.

Dell, once lauded as a distribution pioneer, in more recent months has been roundly criticized for sticking too closely to a once unique direct-mail model that has since been copied by bigger competitors. Some 80% of its sales still come through the direct channel, putting Deexie Jody, Dell USA's group vice president of indirect sales, on the spot. He said Dell's goal is to get as much as half of its sales from the indirect channel in the future, though for 1993, Dell will settle for a more modest 30%.

To do this, Dell needs a "portfolio of channels," Jolly said. Specifically, Dell is looking to expand relationships with systems integrators and value-added resellers, bolster its OEM channel and add retailers and distributors.

Tried and true

Neither Jolly nor Kocher would say that Dell must have a presence in the traditional reseller channel, which remains the largest distribution channel, but sources said Dell's efforts to add this channel

Not like the others

Unlike other major PC vendors, which ship the bulk of PCs themselves, Dell relies on the direct sales and response channel for the majority of its shipments

	Apple	Compaq	Dell	IBM
DEALER	63%	68%		65%
DIRECT SALES / DIRECT RESPONSE	15%		74%	7%
VAR	5%	15%		8%
SYSTEMS INTEGRATOR	5%	2%	3%	

PERCENT OF VENDORS' 1992 TOTAL PC SHIPMENTS THROUGH FOUR CHANNELS

Source: International Data Corp., Framingham, Mass.

have so far been rebuffed. Both executives insisted that Dell would not rush into any deals just to expand distribution but would focus on making sure its agreements were mutually advantageous partnerships.

Mutually advantageous may be difficult to define. For instance, William Tauscher, chairman of ComputerLand Corp., said his company spurned Dell because "we want to commit to someone who wants to be our partner. Dell doesn't really want to do that. They want to run the business and then try to find some cracks and crevices they can use for, but whenever possible they want to go to the direct channel."

At least one analyst said he doubts Dell will be able to spread its distribution model. "I don't see them being successful in trying to get new channels, in part because they just don't have the margins to offer traditional resellers," said Randal Giusto, an analyst at Workgroup Technologies, Inc. in Hampton, N.H.

Despite the competition from IBM and Compaq, Kocher said, "They are not going to succeed at direct. [However,] we're not going to out-IBM IBM or out-Compaq Compaq."

Highly hybrid

Separately, the company is also focused on digesting its growth and engineering a new corporate identity as a "manufacturer," a company that operates effectively as a hybrid distributor and manufacturer.

"We needed to get big fast, and we grew 126% in two years. Now we have an admin head on an adolescent body, and we need to build up the body," Kocher said.

Kocher said he believes a variety of new hires, working on managing supplier relationships, manufacturing processes and creating new order and inventory control systems will give Dell the ability to cope with its growth.

Still, "there are not systems. Systems require design and pilot testing and training and integration and enhancement," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. However, he said he is confident Dell will continue to be among the "creme de la creme" in the PC hardware business.

Wysiwyg

EXPERIENCE ???

One of my favorite experiences, which continues to happen, is watching employees grow and explore their talents — finding them from within the organization and placing them in a challenging position then watching that person grow to be successful. That gives me a tremendous thrill — a real buzz.

Michael King
CEO/President
Software AG of North America, Inc.

Here's a book one of your peers feels is worth reading.

Developing the Leader Within You
John C. Maxwell

This books defines leadership as influence. In these days and times when the management structure is flattening out and there are fewer "positions" and "titles" to go around, this book has helped me gain a new perspective of what a true leader is and how you can develop leadership skills regardless of your title.

Janet Judson
Systems Specialist
Weyerhaeuser Co.

The 5th Wave by Rich Tennant

RECYCLING CENTER — DOS MANUALS — WINDOWS MANUALS

Inside Lines

Necessity breeds coop-etition

Digital Equipment Corp. and IBM will suspend competition this week long enough to disclose a deal under which DEC will drop its DECmcc network management architecture and license IBM's NetView/6000 Unix network manager for use with the Open AXP systems line. DECmcc did not make the cut for the Open Software Foundation's Distributed Management Environment, and its sales have been lower than DEC had hoped. Sources said DEC went to IBM rather than Hewlett-Packard, developer of the OpenView technology that underlies NetView/6000, because it sees IBM's implementation as having more of an enterprisewide focus.

I want my N — TV!

Apparently feeling that it needs a more powerful medium to get the word out about its unfolding enterprise strategies, Novell is preparing to launch the network industry's first satellite television network, according to company sources. Novell will put on regular satellite broadcasts to provide a "hot issues forum" aimed at educators and value-added resellers. The announcement was slated for history this week but will probably be delayed for a few weeks, a Novell source said.

Almost invisible

If you've seen IBM PC Co.'s new ThinkPad 500 subnotebook, you're in a select group. IBM hasn't managed to ship any of the 3.9-pound notebooks yet because of what insiders acknowledge are bad parts. IBM Direct staff members say they don't have a delivery date even now but hint that the system could ship in a couple of weeks.

Everyone's doing it

Ingres plans to unveil on Sept. 13 a database replication product similar to Sybase's Replication Server. The replicator will be sold as a separate product from the Ingres database, according to a source close to the ASK Group subsidiary. The replicator will be priced on a per-user basis, although existing Ingres customers can choose to pay a flat fee if they wish, the source said.

Equal rights

Unify Corp. in Sacramento, Calif., will make the big splash in the client/server application market at Unix Expo next month, where the vendor will introduce a cross-platform development tool set for creating large, complex client/server applications. Beta-test versions of Unify Vision, which can be used to build and deploy applications on Unix and PC platforms, will go into production in November at 30 customer sites. Initially, the product will support Sun SPARCstations, HP 9000s, IBM RS/6000s and Intel-based PCs.

Vaporous fumes

Never let the facts stand in the way of an award. At the 800 Forum 1993 sponsored by The Santa Cruz Operation, Notes from Lotus won the 1993 Product of the Year award in the category of business application software. Of course, winning this award seems to have little to do with the fact that Notes isn't scheduled to be available on the SCO operating system, or any other Unix platform, until the fourth quarter at the earliest.

Clear the DECs! It's Digital from now on. Marketers from the Maynard, Mass.-based mini maker are on an intensive campaign to expunge the "DEC" acronym from the industry's vernacular. They've asked publications to refer to the company as "Digital" from now on. We're happy to comply, but we wonder what Digital is going to do with its DECchip 21064, DECpc, DEC 3000 AXP, DECstations, DECsystem, DECmcc Posse PLDECnet/OSI, DECbook 500, DECnis 3000 routers, DECconnectors, DECstorage, DEClaser, DECbridge, DECservers, DECtalk, DECrouter, DEC/CMS, DEC Fuseal, DEC Posters, DEC Atis, DEC Cobol, DEC C++, DECforms, DEC Ada, DEC DBMS, DEC FMS, DEC UDL, DECnet, DEC 20 Integrator, DEC DBA Workcenter, DEC Rally and DECwindows Motif. We'll probably find out at the next DECworld. Phone, fax or Compuserve Notes! Editor Alan Alper with news tips at (800) 343-6474, (508) 879-0700 or MCI 5413, respectively. Or any Computerworld's 24-hour voice-mail tip line at (508) 626-3344.